

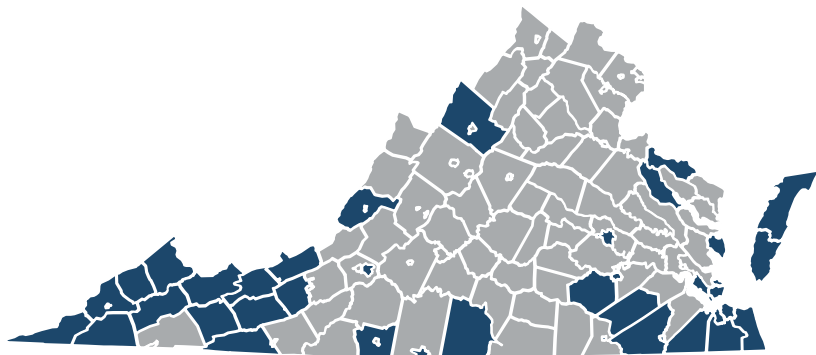


2021 HAZARD MITIGATION ASSISTANCE GRANTS EQUITY WORKSHOPS

The Deloitte Health360 Solution informs population vulnerability and enables a data-driven approach to operationalizing equity in mitigation projects. It is broken down into two components: Population Vulnerability and Hazard Risk. Both components are added together to identify potential priority areas to support future mitigation projects.

SERIES OBJECTIVES

- 1 Interpret data from the Deloitte Analysis and identify flooding risk in these areas.
- 2 Understand and explore potential solutions to hazard risk areas and vulnerable populations.
- 3 Educate stakeholders on funding programs such as FEMA hazard mitigation grants, CDBG grants, and the new CFP fund.
- 4 Discuss next steps, technical assistance needs, and training.



POPULATION VULNERABILITY

Provides a people-focused metric that can be combined with infrastructure, elevation, and financial metrics to support a holistic approach to mitigation planning.



HAZARD RISK

Reflects the number of households in each flood or hurricane zone weighted by risk severity to provide a people-focused risk metric.



PRIORITIZED CENSUS TRACTS

Combining population vulnerability and hazard risk at a sub-locality level can identify potential priority areas to support with future mitigation projects.

40 Localities Identified Scoring Over 70%





SUBREGIONAL WORKSHOP

August 18, 2021 from 10am to 12pm

Dinwiddie ●
Petersburg ●
Richmond City ●

POPULATION VULNERABILITY

Provides a people-focused metric that can be combined with infrastructure, elevation, and financial metrics to support a holistic approach to mitigation planning.



HAZARD RISK

Reflects the number of households in each flood or hurricane zone weighted by risk severity to provide a people-focused risk metric.

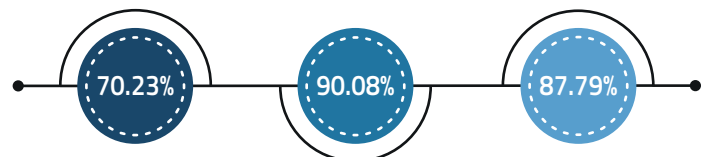


PRIORITIZED CENSUS TRACTS

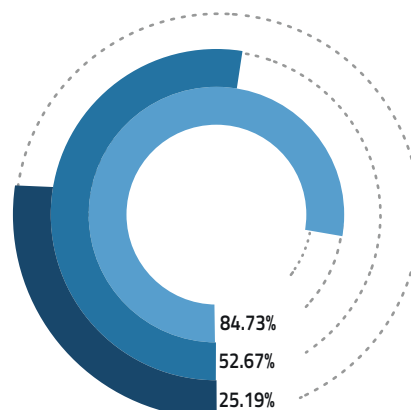
Combining population vulnerability and hazard risk at a sub-locality level can identify potential priority areas to support with future mitigation projects.



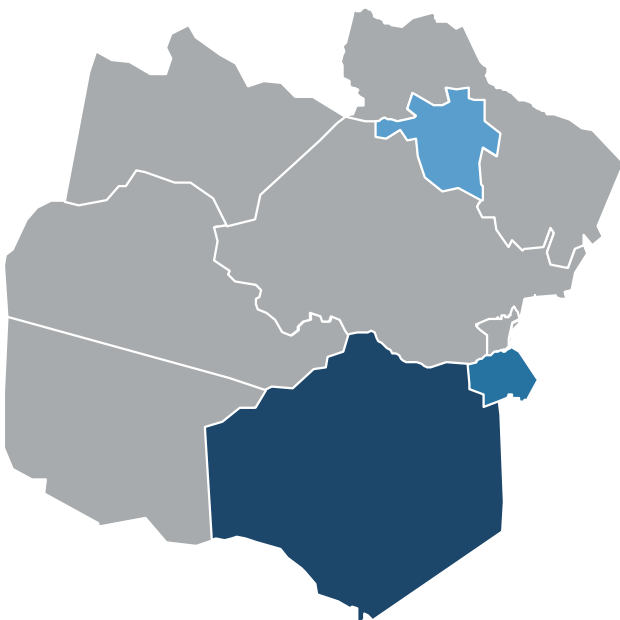
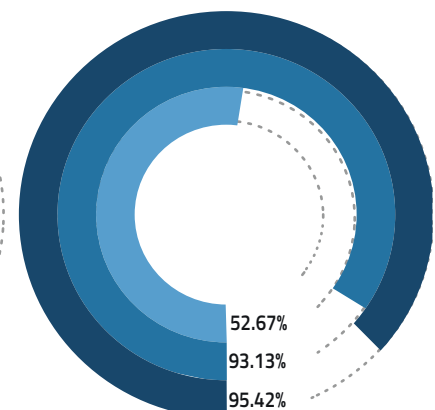
OVERALL PERCENTILE



HAZARD RISK PERCENTILE



POPULATION VULNERABILITY PERCENTILE



COVID-19 Unified Command/VEST Health Equity Working Group

MITIGATION PROJECTS ANALYSIS
RICHMOND CITY

NOVEMBER 2020



Topics

The analysis provides **Richmond City** with information to support planning and preparation of projects for the Building Resilient Infrastructure and Communities (BRIC) grant application with an equity focus.

- ❑ Introduction to Data-Driven Approach
- ❑ Hazard Risk
- ❑ Population Vulnerability
- ❑ Prioritization
- ❑ FEMA Funding and Past Projects
- ❑ Considerations for Next Steps

This analysis *expands the scope of population vulnerability* to provide a *data-driven equity lens* for disaster mitigation project design

Data-Driven Approach

The Health360 platform informs population vulnerability and enables a data-driven approach to operationalizing equity in mitigation projects.

Powered By Health360



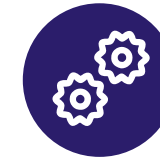
230M+
U.S. Adults Scored



Data updated every
1 Month



Contains over
1,500+
variables on Social
Determinants of Health
and other metrics



150+
Advanced predictive
algorithms



400+

Variables used in the
mortality predictive
algorithm



Provides **360°** view
of a person



Algorithms rebuilt
every **2 years**



40+
Clients served

What is hazard risk and how is it calculated?

Household Hazard risk reflects the number of households in each flood or hurricane zone, weighted by severity.



Hazard Risk

Number of households in each zone:

Flood zones

- 100 year coastal
- 100 year riverine flood way
- 100 year riverine
- 500 year riverine

Hurricane zones

- Segmented A, B, C, D

- Households that reside in the flood and hurricane zones are considered to be **at-risk for environmental disasters**
- Hazard Risk reflects **the number of households located in Flood and Hurricane Zones**
- Hazard Risk is not a measure of **infrastructure, elevation, or financial risks**, but is a measure of the number of at-risk households in an area, weighted by the severity of the risk, to **provide a people-focused risk metric**

Note: Severity of the risk per household is captured on an ordinal scale from 1 – least severe (Hurricane Zone D, 500 Year Riverine) to 4 – most severe (Hurricane Zone A, 100 Year Coastal)

Hazard Risk = (# of Households in Particular Hurricane or Flood Zones) X (Specified Zone Risk Level (1 through 4 depending on risk severity))

Hazard Risk in Your Locality

The figures below indicate how your locality's hazard risk¹ compares to others in Virginia as well as how many households reside in each flood or hurricane zone.

Hazard Risk¹ Percentile

85th

Your locality has more households in more severe flood/hurricane zones than 85% of other Virginia localities

Hazard Risk¹ Rank

21st

Your locality's Hazard Risk score is ranked 21st out of 132 Virginia localities

Households in Flood Zones & Locality Rank			
← 100 Year Coastal	100 Year Riverine Floodway	100 Year Riverine	→ Severity 500 Year Riverine
0	46	920	1,242
N/A out of 132 Localities	27th out of 132 Localities	16th out of 132 Localities	11th out of 132 Localities

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk

Households in Hurricane Zones & Locality Rank			
← Zone A	Zone B	Zone C	→ Severity Zone D
0	0	0	0
N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities

Evacuation zones designated as A through D are in place across coastal Virginia

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

What is population vulnerability and how is it calculated?

The Population Vulnerability score provides a people-focused metric that can be combined with infrastructure, elevation, and financial metrics to support a holistic approach to mitigation planning.



Population Vulnerability

Prevalence of:

1. Communities of color
2. Elevated health risk
3. Low income
4. # of people in household
5. # of children in household
6. Unemployment risk
7. Age (older adults)
8. Lack of vehicle access

- Population Vulnerability **expands upon the 2018 Virginia Hazard Mitigation plan definition** of population vulnerability (density and percentage of total population)
- Population Vulnerability **only considers localities with households in flood or hurricane zones (132 localities)**
- Population Vulnerability **identifies the locality and census tracts/census blocks** with the most vulnerable individuals/households on average
- Population Vulnerability should be interpreted as a **household's ability to safely respond** to an environmental disaster

Population Vulnerability in Your Locality

The figures below indicate how your locality's population vulnerability¹ score and composite attributes compare to other localities in Virginia.

Population Vulnerability¹ Percentile

53rd

On average, a household in a flood or hurricane zone in your locality is more vulnerable than a household in 53% of other Virginia localities

Population Vulnerability¹ Rank

63rd

Your locality's Population Vulnerability score is ranked 63rd out of 132 Virginia localities

How RICHMOND CITY Compares to Other Localities Across the Eight Vulnerability Attributes

Low Income

64th

percentile

Elevated Health Risk

53rd

percentile

Age

4th

percentile

Communities of Color

84th

percentile

of Children in Household

17th

percentile

of People in Household

5th

percentile

Unemployment Risk

90th

percentile

Lack of Vehicle Access

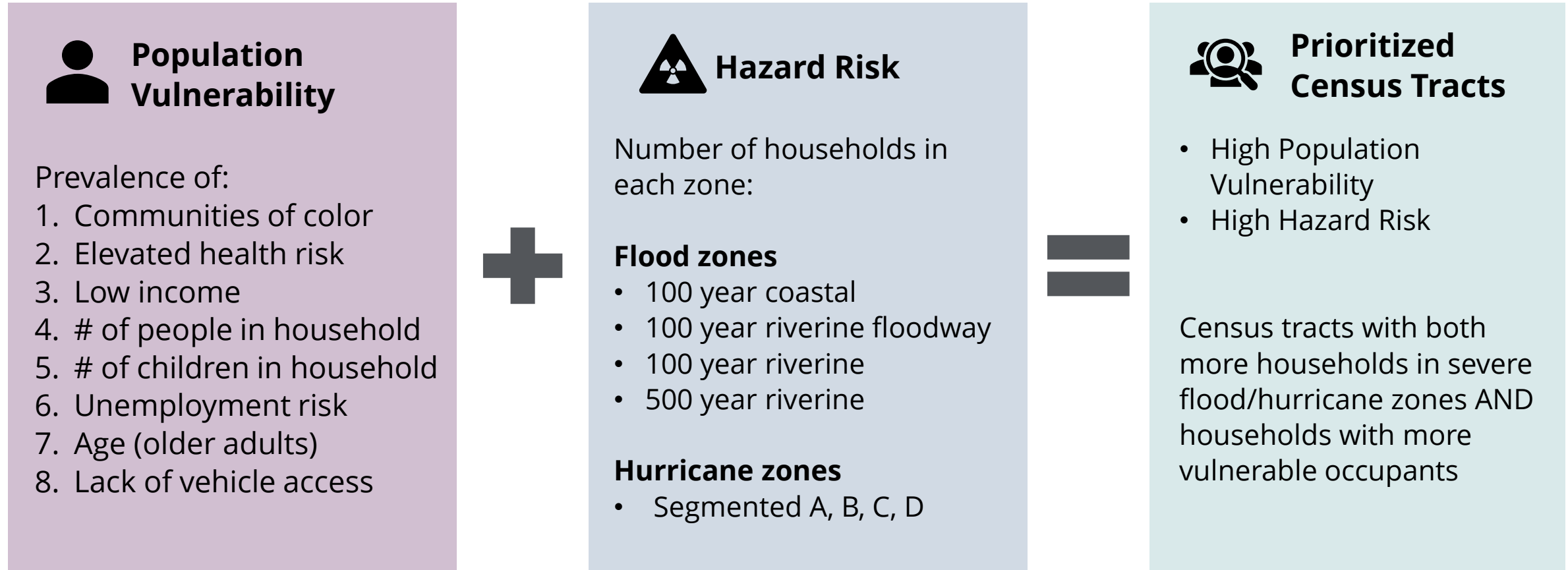
90th

percentile

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

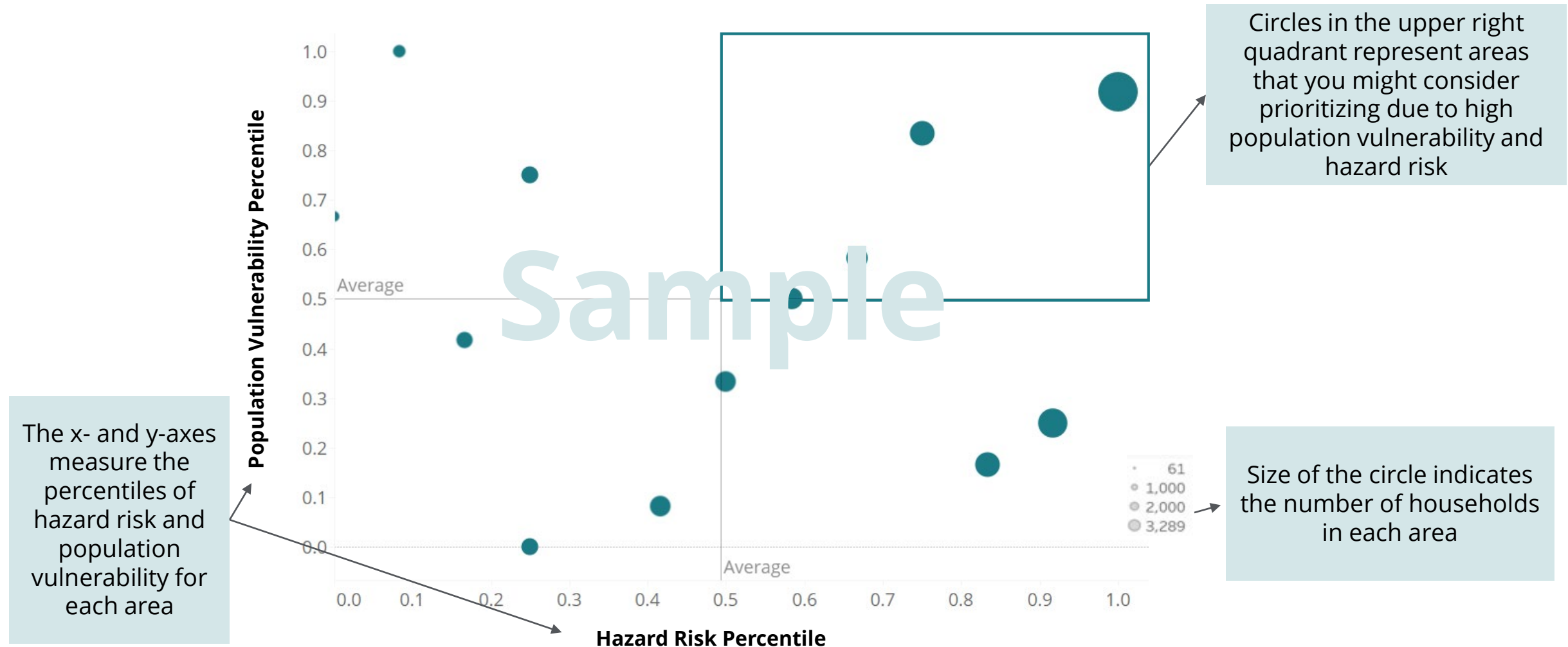
Using Population Vulnerability & Hazard Risk to Prioritize Census Tracts

Combining population vulnerability and hazard risk at a sub-locality level can identify potential priority areas to support with future mitigation projects.



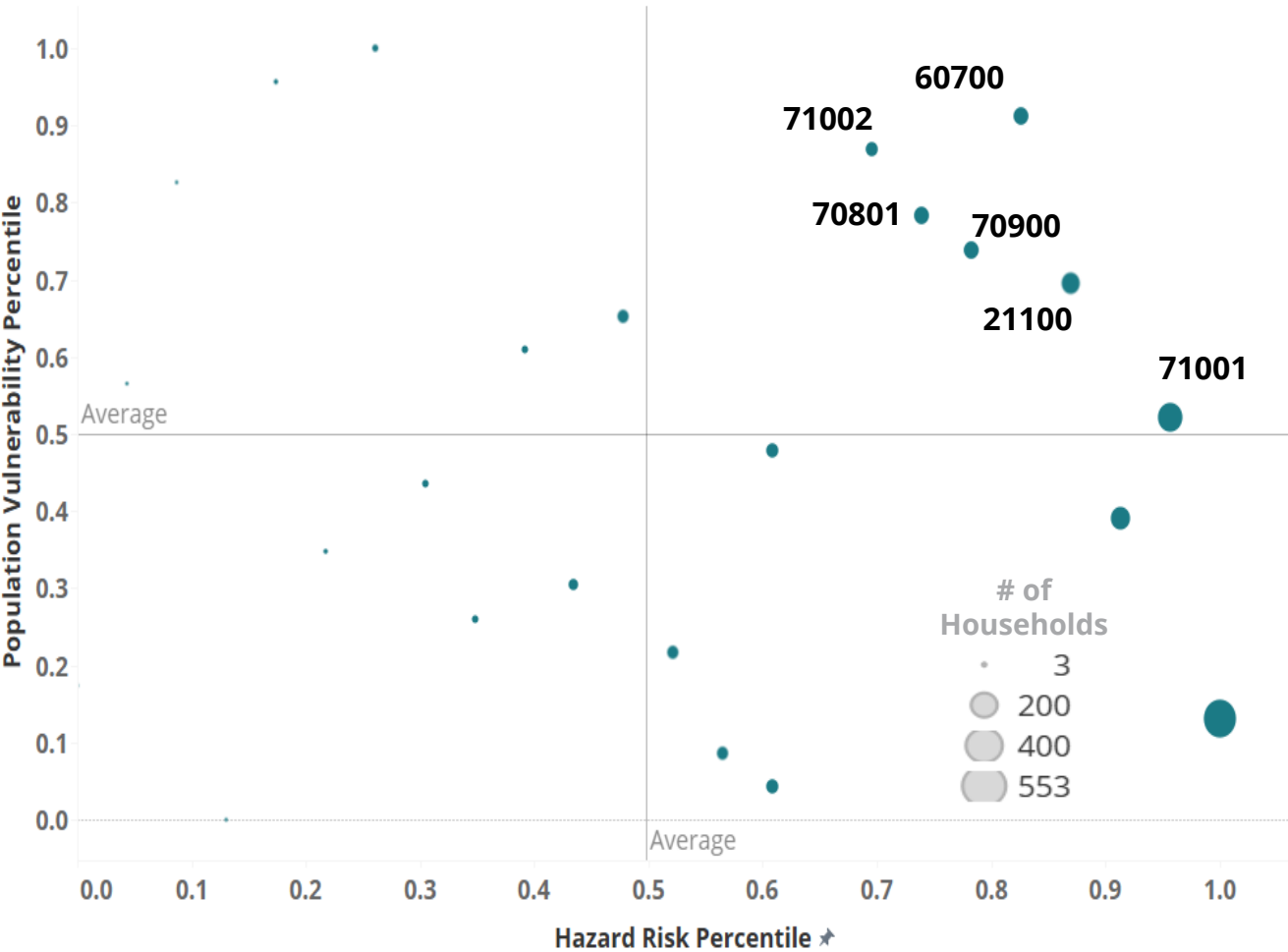
How to interpret the Census Tract plots

The chart below represents a *sample* locality and offers guidance on how to interpret the information when planning mitigation efforts.



Prioritizing Census Tracts in Richmond City

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.



Priority Areas in Flood and Hurricane Zones

			Within-Richmond City Percentiles		
#	Area	# of Households	Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	60700	115	100th	91st	83rd
2	21100	175	91st	70th	87th
3	71002	80	91st	87th	70th
4	70801	122	83rd	78th	74th
5	70900	119	83rd	74th	78th
6	71001	321	78th	52nd	96th
7	61000	199	74th	39th	91st
8	70602	20	70th	100th	26th

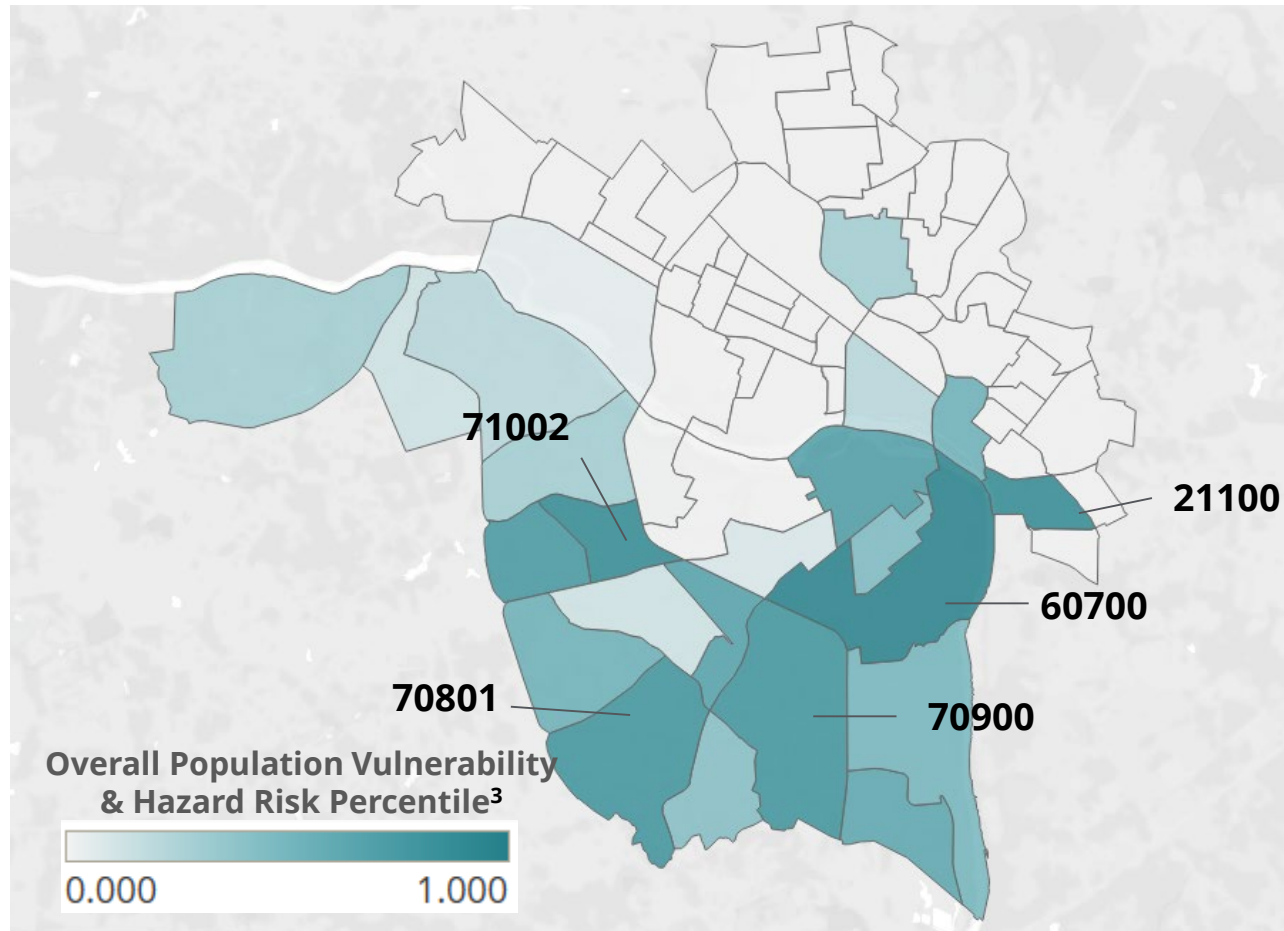
1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity

Prioritizing Census Tracts in Richmond City continued

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.

Potential Priority Areas in Richmond City



Priority Areas in Flood and Hurricane Zones

#	Area	# of Households	Within-Richmond City Percentiles		
			Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	60700	115	100th	91st	83rd
2	21100	175	91st	70th	87th
3	71002	80	91st	87th	70th
4	70801	122	83rd	78th	74th
5	70900	119	83rd	74th	78th
6	71001	321	78th	52nd	96th
7	61000	199	74th	39th	91st
8	70602	20	70th	100th	26th

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
3. Sub-localities at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Priority Census Tracts Summary

When evaluating future mitigation project opportunities, it may be helpful to consider the underlying attributes of population vulnerability and the number of houses in each flood/hurricane zone.

#	Census Tract	# of Households	Within-Richmond City Percentiles									
			Overall	Population Vulnerability ¹	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unemployment Risk	Age	Lack of Vehicle Access
1	60700	115	100th	91st	87th	91st	96th	78th	78th	83rd	65th	91st
2	21100	175	91st	70th	91st	70th	43rd	57th	52nd	43rd	57th	48th
3	71002	80	91st	87th	65th	61st	74th	70th	91st	70th	39th	61st

#	Census Tract	# of Households	W/I-Richmond City Percentiles		Richmond City Household Counts ³							
			Overall	Hazard Risk ²	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D
1	60700	115	100th	83rd	0	3	107	5	0	0	0	0
2	21100	175	91st	87th	0	0	0	175	0	0	0	0
3	71002	80	91st	70th	0	0	80	0	0	0	0	0

1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
3. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

Review of FEMA Funding & Past Mitigation Projects

Review of Mitigation Projects In Your Locality

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.

Total Exclusive Project Funding¹

\$50,080

This is the total amount of federal funding allotted to mitigation projects solely owned by your locality from 1990-2019

Total Shared Project Funding¹

\$2,154,749

This is the total amount of federal funding allotted to mitigation projects owned by your locality and at least 1 other from 1990-2019

Exclusive Projects

2

Average Exclusive Project Size

\$25K

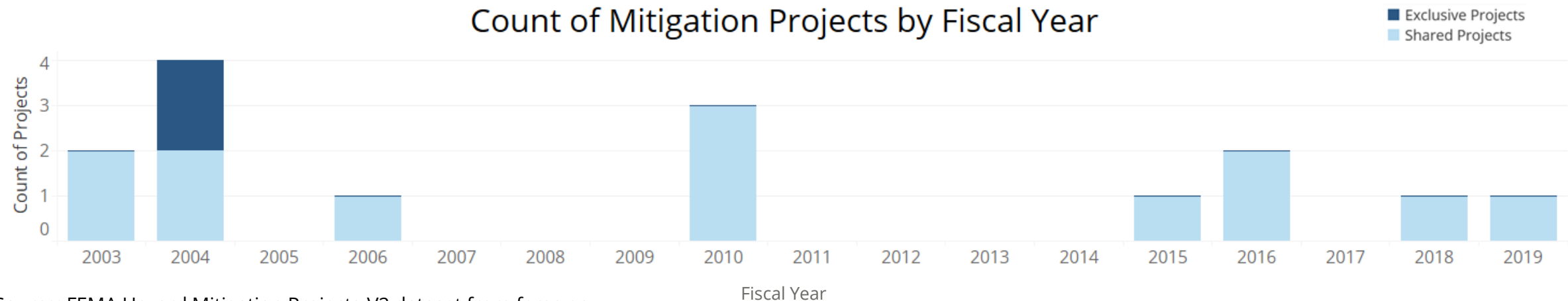
Shared Projects

13

Average Counties Per Shared Project

6.3

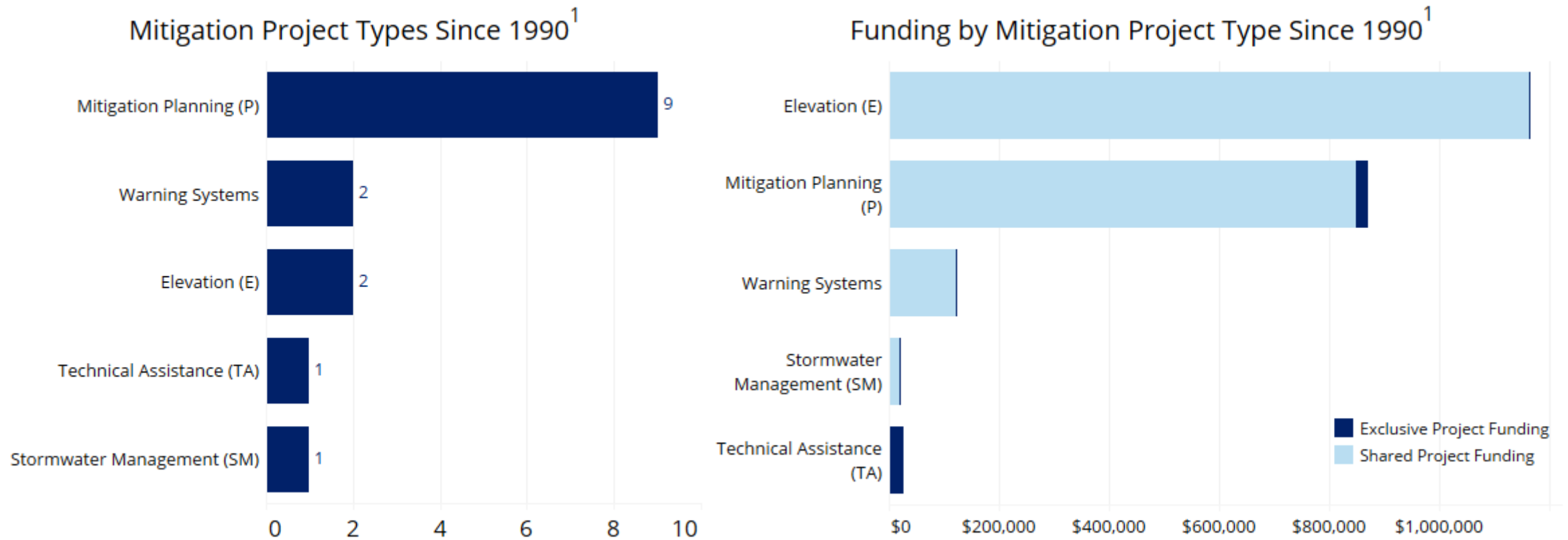
Count of Mitigation Projects by Fiscal Year



1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

Past Mitigation Projects – Top Project Types

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.

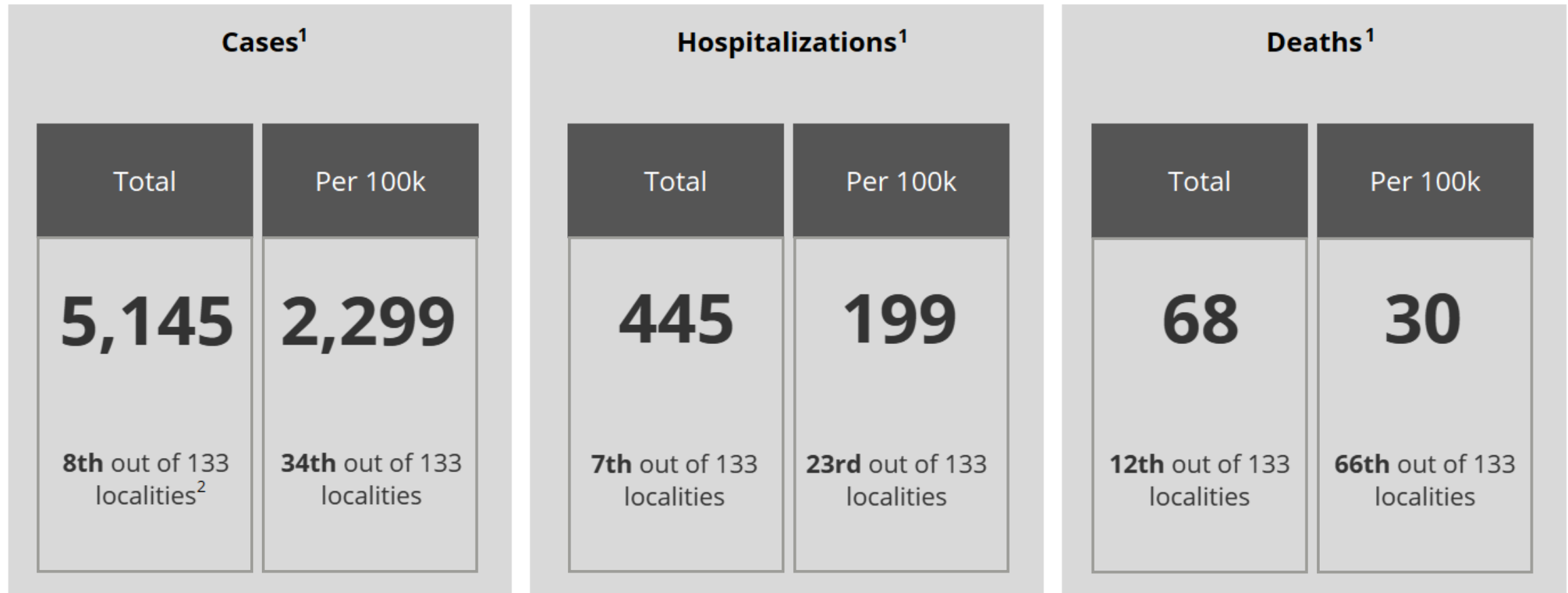


1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

COVID-19 Impacts

COVID-19 In Your Locality

Since the beginning of the COVID-19 Pandemic, Richmond City has experienced the following:



1. COVID-19 case, hospitalization, and death figures are sourced from the Virginia Department of Health as of **10/21/2020**

2. COVID-19 Impact rankings are for all 133 Virginia localities, rather than the 132 included in the BRIC analysis for having at least one household in a flood or hurricane zone

Considerations for Next Steps

Considerations for Next Steps

When evaluating future mitigation project opportunities, the population vulnerability and hazard risk metrics can supplement existing measures to design mitigation projects with an equity lens.

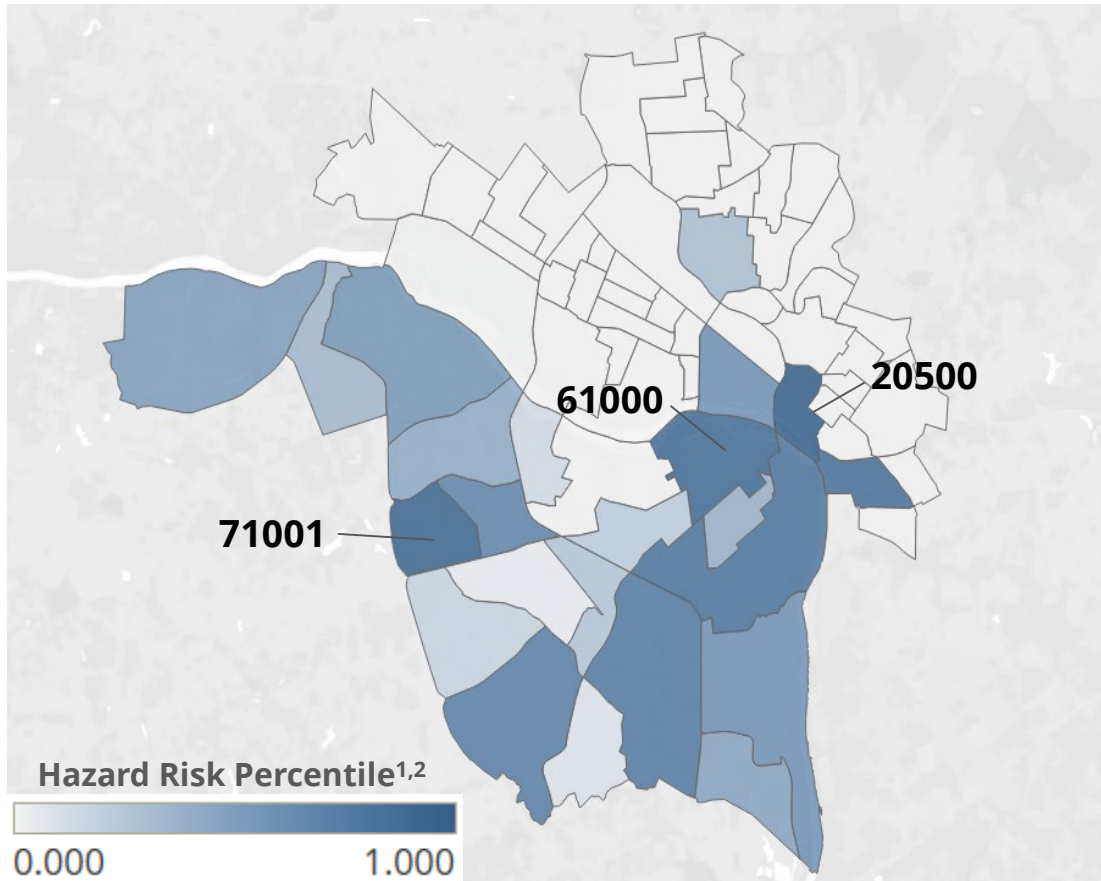
- Consider targeting **priority areas** when designing future mitigation projects
- Consider analysis at the **census tract/block level** to understand population vulnerability and hazard risks at a granular level to support decisions on mitigation projects
- Consider **supplementing these people-focused metrics** with existing infrastructure, elevation, and financial analysis for a holistic mitigation planning approach that includes equity considerations
- Consider **past project types** and **prior funding** in the overall mitigation strategy

Appendix

What areas in your locality have the greatest hazard risk?

When designing mitigation projects, it may be helpful to consider specific census tracts that have the greatest number of households residing in the more severe flood and/or hurricane zones.

Hazard Risk¹ in Richmond City



Top-5 Census Tracts for Hazard Risk¹

#	Census Tract	# of Households	Hazard Risk Percentile	Richmond City Household Counts							
				100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr. Zone D
1	20500	553	100th	0	0	81	472	0	0	0	0
2	71001	321	96th	0	13	308	0	0	0	0	0
3	61000	199	91st	0	0	0	199	0	0	0	0
4	21100	175	87th	0	0	0	175	0	0	0	0
5	60700	115	83rd	0	3	107	5	0	0	0	0

Note: see the appendix for a data table for the Top 15 Census Tracts

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

What is population vulnerability and how is it calculated? *continued*

The vulnerability score for each Virginia household reflects an estimate of the household's ability to safely respond in the event of an environmental disaster.



Population Vulnerability

Attribute ¹	Weighting ²	Description (in a household)
Low Income	18%	Number of adults with income less than \$30,000
Elevated Health Risk	17%	Number of adults with one or more serious health conditions
Age (Older Adults)	15%	Number of adults who are age 65 and older
Communities of Color	13%	Number of Black or African American or Hispanic or Latino adults
# of Children in Household	12%	Number of children
# of People in Household	10%	Number of adults and children
Unemployment Risk	8%	Number of adults at high risk of unemployment
Lack of Vehicle Access	6%	Does the household lack access to a motor vehicle?

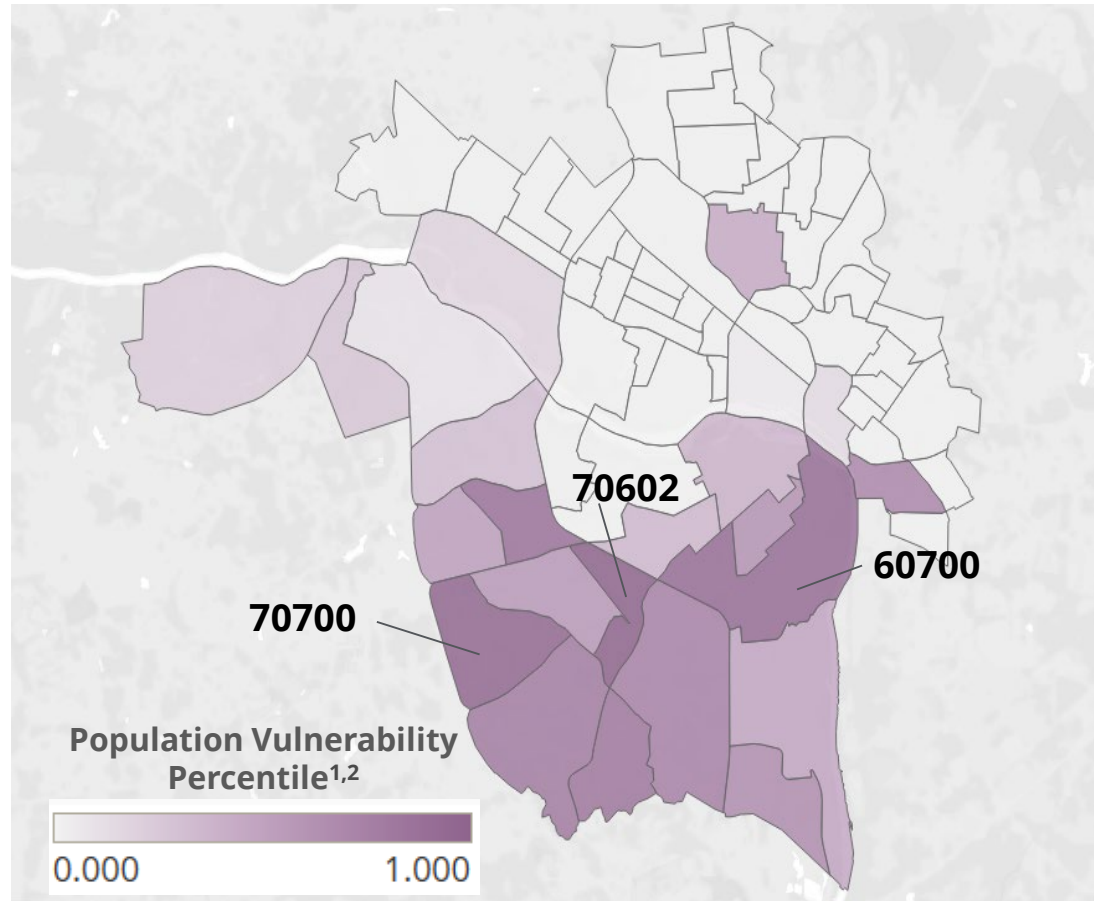
1. Two attributes - English as a Primary Language and Prevalence of Mobile Housing - were dropped from consideration based on the 8/20/2020 BRIC Working Group Session

2. Attribute contributions to Population Vulnerability were weighted as a result of the BRIC Working Group Session on 8/20/2020

What areas in your locality have the greatest population vulnerability?

When designing mitigation projects, it may be helpful to consider specific census tracts that are home to the most vulnerable individuals in the event of an environmental disaster.

Population Vulnerability¹ in Richmond City



Top-5 Census Tracts for Population Vulnerability¹

#	Census Tract	# of Households	Within-Richmond City Percentiles								
			Pop. Vul.	Comm. of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unem. Risk	Age	Vehicle Access
1	70602	20	100th	96th	96th	91st	96th	100th	61st	17th	52nd
2	70700	10	96th	74th	83rd	100th	83rd	74th	96th	83rd	0th
3	60700	115	91st	87th	91st	96th	78th	78th	83rd	65th	91st
4	71002	80	87th	65th	61st	74th	70th	91st	70th	39th	61st
5	70802	6	83rd	100th	100th	30th	65th	39th	48th	87th	0th

Note: see the appendix for a data table for the Top 15 Census Tracts

1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Data table | Population Vulnerability & Hazard Risk

#	Census Tract	# of Households	Percentiles										Within-Locality Household Counts								
			Overall	Population Vulnerability	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unemployment Risk	Age	Lack of Vehicle Access	Hazard Risk	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D
1	60700	115	100th	91st	87th	91st	96th	78th	78th	83rd	65th	91st	83rd	0	3	107	5	0	0	0	0
2	21100	175	91st	70th	91st	70th	43rd	57th	52nd	43rd	57th	48th	87th	0	0	0	175	0	0	0	0
3	71002	80	91st	87th	65th	61st	74th	70th	91st	70th	39th	61st	70th	0	0	80	0	0	0	0	0
4	70801	122	83rd	78th	61st	74th	65th	52nd	83rd	78th	13rd	78th	74th	0	0	0	122	0	0	0	0
5	70900	119	83rd	74th	70th	26th	70th	61st	87th	65th	26th	65th	78th	0	0	68	51	0	0	0	0
6	71001	321	78th	52nd	48th	52nd	52nd	35th	65th	74th	22nd	83rd	96th	0	13	308	0	0	0	0	0
7	61000	199	74th	39th	39th	39th	48th	13rd	22nd	100th	4th	70th	91st	0	0	0	199	0	0	0	0
8	70602	20	70th	100th	96th	96th	91st	96th	100th	61st	17th	52nd	26th	0	0	0	20	0	0	0	0
9	60900	58	65th	65th	26th	48th	87th	43rd	61st	87th	52nd	87th	48th	0	0	25	33	0	0	0	0
10	20500	553	57th	13rd	17th	22nd	39th	17th	17th	39th	30th	43rd	100th	0	0	81	472	0	0	0	0
11	70700	10	57th	96th	74th	83rd	100th	83rd	74th	96th	83rd	0th	17th	0	0	0	10	0	0	0	0
12	60800	80	52nd	48th	52nd	9th	78th	48th	70th	57th	35th	96th	61st	0	0	53	27	0	0	0	0
13	60200	28	48th	61st	43rd	57th	61st	26th	43rd	91st	9th	100th	39th	0	0	27	1	0	0	0	0
14	70802	6	43rd	83rd	100th	100th	30th	65th	39th	48th	87th	0th	9th	0	0	0	6	0	0	0	0
15	70100	62	30th	22nd	22nd	30th	0th	87th	48th	22nd	100th	39th	52nd	0	5	35	22	0	0	0	0

1. Note: These figures only account for census areas that have households in flood and/or hurricane zones

For internal use only by the Commonwealth of Virginia. Output based on available data.

Data table | FEMA Funding¹

Grantee	Year of Fiscal Year	Exclusive vs Shared	Subgrantee	Project Counties	Project Type(s)	Federal Funds Obligated
RICHMOND CITY	2019	Shared	RICHMOND R.	PETERSBURG (CITY); EMPORIA (CITY); C..	91.5: Local Multijurisdictional Multiha..	\$187,500
	2018	Shared	Northern Nec..	LANCASTER; NORTHUMBERLAND; RIC..	202.2: Elevation of Private Structures ..	\$757,236
	2016	Shared	Northern Neck Planning District Com..	LANCASTER; NORTHUMBERLAND; RIC..	91.5: Local Multijurisdictional Multiha..	\$53,756
				RICHMOND	202.2: Elevation of Private Structures ..	\$407,325
	2015	Shared	Richmond Re..	CHARLES CITY; CHESTERFIELD; COLONI..	91.1: Local Multihazard Mitigation Plan	\$135,000
	2010	Shared	Northern Nec..	LANCASTER; NORTHUMBERLAND; RIC..	91.1: Local Multihazard Mitigation Plan	\$37,501
			Richmond	RICHMOND (CITY)	600.1: Warning Systems (as a Compo..	\$35,349
			Richmond an..	CHARLES CITY; CHESTERFIELD; COLONI..	91.1: Local Multihazard Mitigation Plan	\$120,000
	2006	Shared	VIRGINIA CO..	RICHMOND	91.1: Local Multihazard Mitigation Plan	\$179,763
	2004	Exclusive	VDEM	RICHMOND CITY	91.1: Local Multihazard Mitigation Plan	\$23,500
					701.2: Technical Assistance - Applicati..	\$26,580
		Shared	Richmond	RICHMOND (CITY)	403.3: Stormwater Management - Fla..	\$20,250
					600.1: Warning Systems (as a Compo..	\$85,921
	2003	Shared	NORTHERN N..	RICHMOND; NORTHUMBERLAND; LAN..	91.1: Local Multihazard Mitigation Plan	\$58,760
			RICHMOND R..	RICHMOND	91.1: Local Multihazard Mitigation Plan	\$76,388

1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

COVID-19 Unified Command/VEST Health Equity Working Group

MITIGATION PROJECTS ANALYSIS
PETERSBURG CITY

NOVEMBER 2020



Topics

The analysis provides **Petersburg City** with information to support planning and preparation of projects for the Building Resilient Infrastructure and Communities (BRIC) grant application with an equity focus.

- ❑ Introduction to Data-Driven Approach
- ❑ Hazard Risk
- ❑ Population Vulnerability
- ❑ Prioritization
- ❑ FEMA Funding and Past Projects
- ❑ Considerations for Next Steps

This analysis ***expands the scope of population vulnerability*** to provide a ***data-driven equity lens*** for disaster mitigation project design

Data-Driven Approach

The Health360 platform informs population vulnerability and enables a data-driven approach to operationalizing equity in mitigation projects.

Powered By Health360



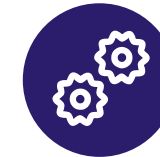
230M+
U.S. Adults Scored



Data updated every
1 Month



Contains over
1,500+
variables on Social
Determinants of Health
and other metrics



150+
Advanced predictive
algorithms



400+

Variables used in the
mortality predictive
algorithm



Provides **360°** view
of a person



Algorithms rebuilt
every **2 years**



40+
Clients served

What is hazard risk and how is it calculated?

Household Hazard risk reflects the number of households in each flood or hurricane zone, weighted by severity.



Hazard Risk

Number of households in each zone:

Flood zones

- 100 year coastal
- 100 year riverine flood way
- 100 year riverine
- 500 year riverine

Hurricane zones

- Segmented A, B, C, D

- Households that reside in the flood and hurricane zones are considered to be **at-risk for environmental disasters**
- Hazard Risk reflects **the number of households located in Flood and Hurricane Zones**
- Hazard Risk is not a measure of **infrastructure, elevation, or financial risks**, but is a measure of the number of at-risk households in an area, weighted by the severity of the risk, to **provide a people-focused risk metric**

Note: Severity of the risk per household is captured on an ordinal scale from 1 – least severe (Hurricane Zone D, 500 Year Riverine) to 4 – most severe (Hurricane Zone A, 100 Year Coastal)

Hazard Risk = (# of Households in Particular Hurricane or Flood Zones) X (Specified Zone Risk Level (1 through 4 depending on risk severity))

Hazard Risk in Your Locality

The figures below indicate how your locality's hazard risk¹ compares to others in Virginia as well as how many households reside in each flood or hurricane zone.

Hazard Risk¹ Percentile
53rd

Your locality has more households in more severe flood/hurricane zones than 53% of other Virginia localities

Hazard Risk¹ Rank
63rd

Your locality's Hazard Risk score is ranked 63rd out of 132 Virginia localities

Households in Flood Zones & Locality Rank			
← 100 Year Coastal	100 Year Riverine Floodway	100 Year Riverine	Severity → 500 Year Riverine
0	184	112	103
N/A out of 132 Localities	6th out of 132 Localities	81st out of 132 Localities	47th out of 132 Localities

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk

Households in Hurricane Zones & Locality Rank			
← Zone A	Zone B	Zone C	Severity → Zone D
0	0	0	0
N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities

Evacuation zones designated as A through D are in place across coastal Virginia

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

What is population vulnerability and how is it calculated?

The Population Vulnerability score provides a people-focused metric that can be combined with infrastructure, elevation, and financial metrics to support a holistic approach to mitigation planning.



Population Vulnerability

Prevalence of:

1. Communities of color
2. Elevated health risk
3. Low income
4. # of people in household
5. # of children in household
6. Unemployment risk
7. Age (older adults)
8. Lack of vehicle access

- Population Vulnerability **expands upon the 2018 Virginia Hazard Mitigation plan definition** of population vulnerability (density and percentage of total population)
- Population Vulnerability **only considers localities with households in flood or hurricane zones (132 localities)**
- Population Vulnerability **identifies the locality and census tracts/census blocks** with the most vulnerable individuals/households on average
- Population Vulnerability should be interpreted as a **household's ability to safely respond** to an environmental disaster

Population Vulnerability in Your Locality

The figures below indicate how your locality's population vulnerability¹ score and composite attributes compare to other localities in Virginia.

Population Vulnerability¹ Percentile

93rd

On average, a household in a flood or hurricane zone in your locality is more vulnerable than a household in 93% of other Virginia localities

Population Vulnerability¹ Rank

10th

Your locality's Population Vulnerability score is ranked 10th out of 132 Virginia localities

How PETERSBURG CITY Compares to Other Localities Across the Eight Vulnerability Attributes

Low Income

91st

percentile

Elevated Health Risk

52nd

percentile

Age

15th

percentile

Communities of Color

94th

percentile

of Children in Household

34th

percentile

of People in Household

17th

percentile

Unemployment Risk

95th

percentile

Lack of Vehicle Access

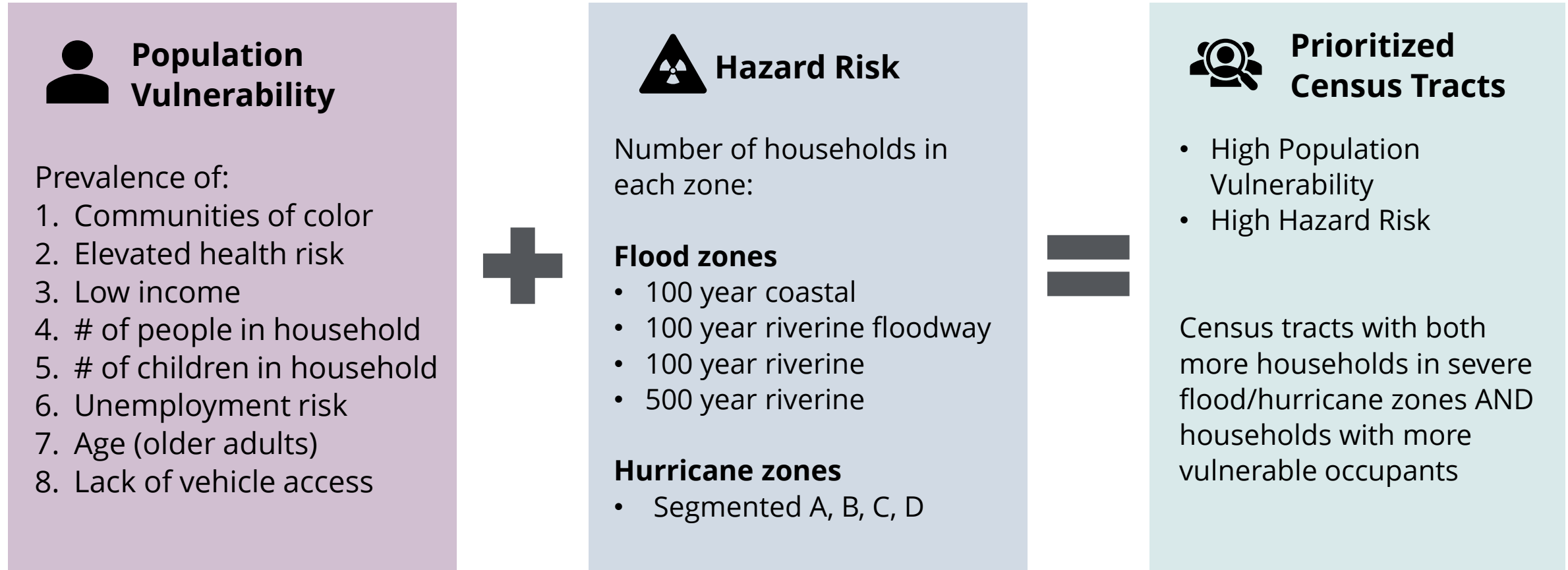
95th

percentile

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

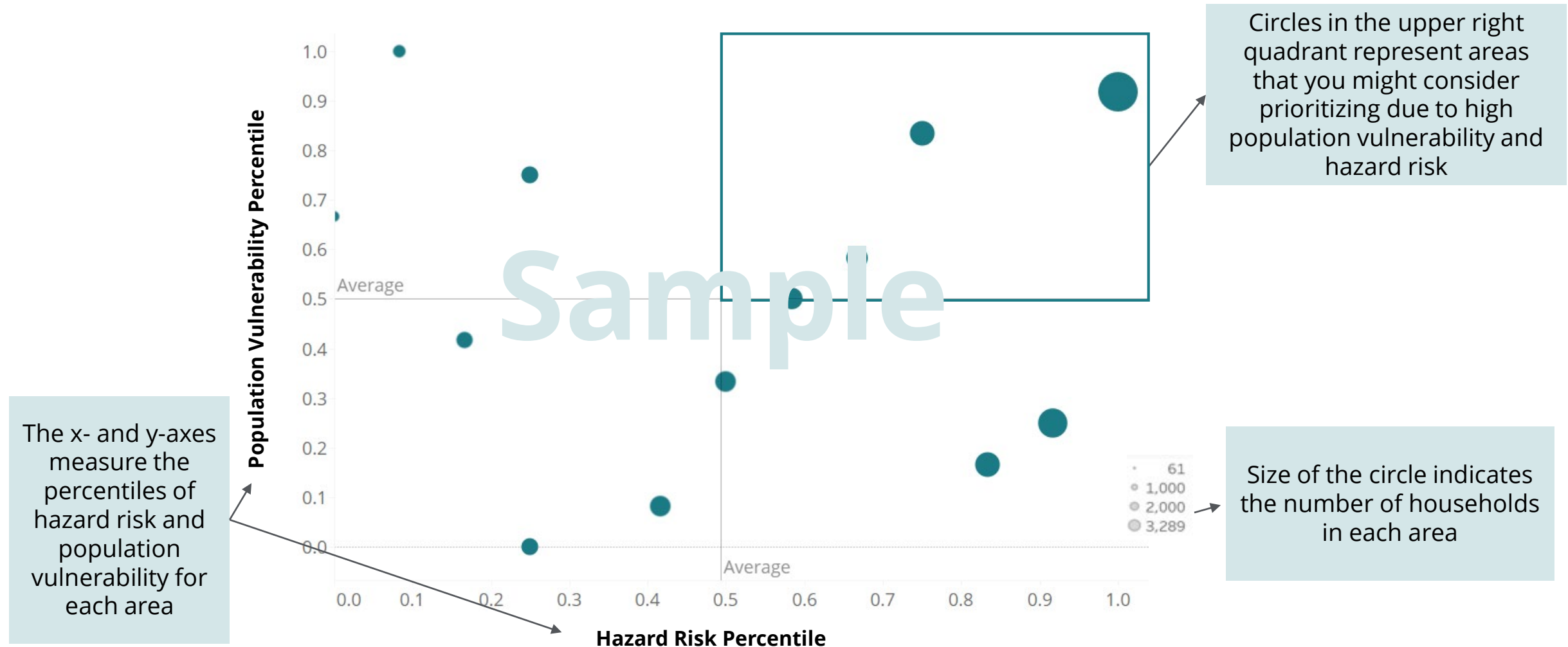
Using Population Vulnerability & Hazard Risk to Prioritize Census Tracts

Combining population vulnerability and hazard risk at a sub-locality level can identify potential priority areas to support with future mitigation projects.



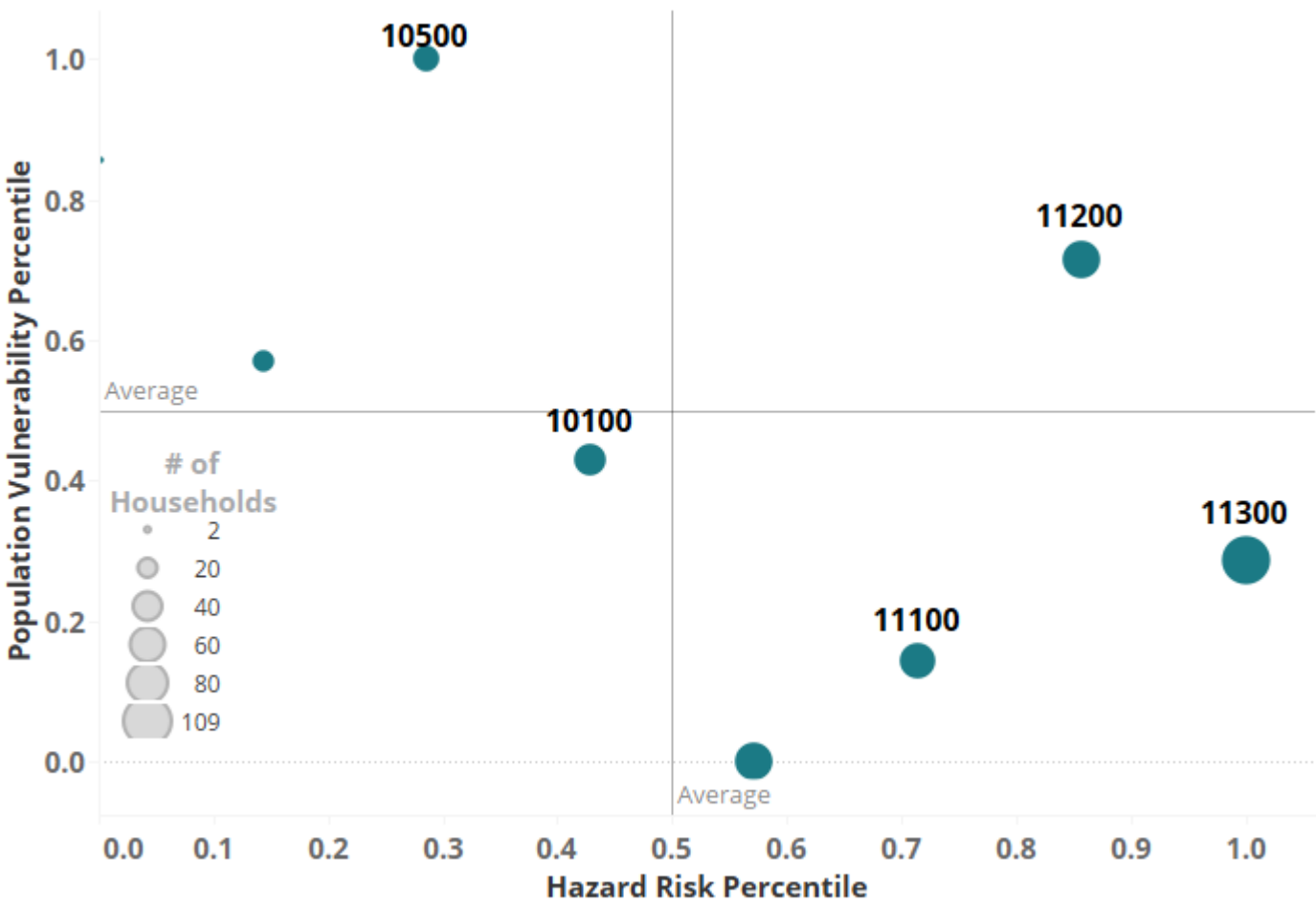
How to interpret the Census Tract plots

The chart below represents a *sample* locality and offers guidance on how to interpret the information when planning mitigation efforts.



Prioritizing Census Tracts in Petersburg City

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.



Priority Areas in Flood and Hurricane Zones

			Within-Petersburg City Percentiles		
#	Area	# of Households	Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	11200	66	100th	71st	86th
2	11300	109	71st	29th	100th
3	10500	32	71st	100th	29th
4	11100	59	57th	14th	71st
5	10100	47	43rd	43rd	43rd
6	11000	2	29th	86th	0th
7	10600	22	14th	57th	14th
8	10300	62	0th	0th	57th

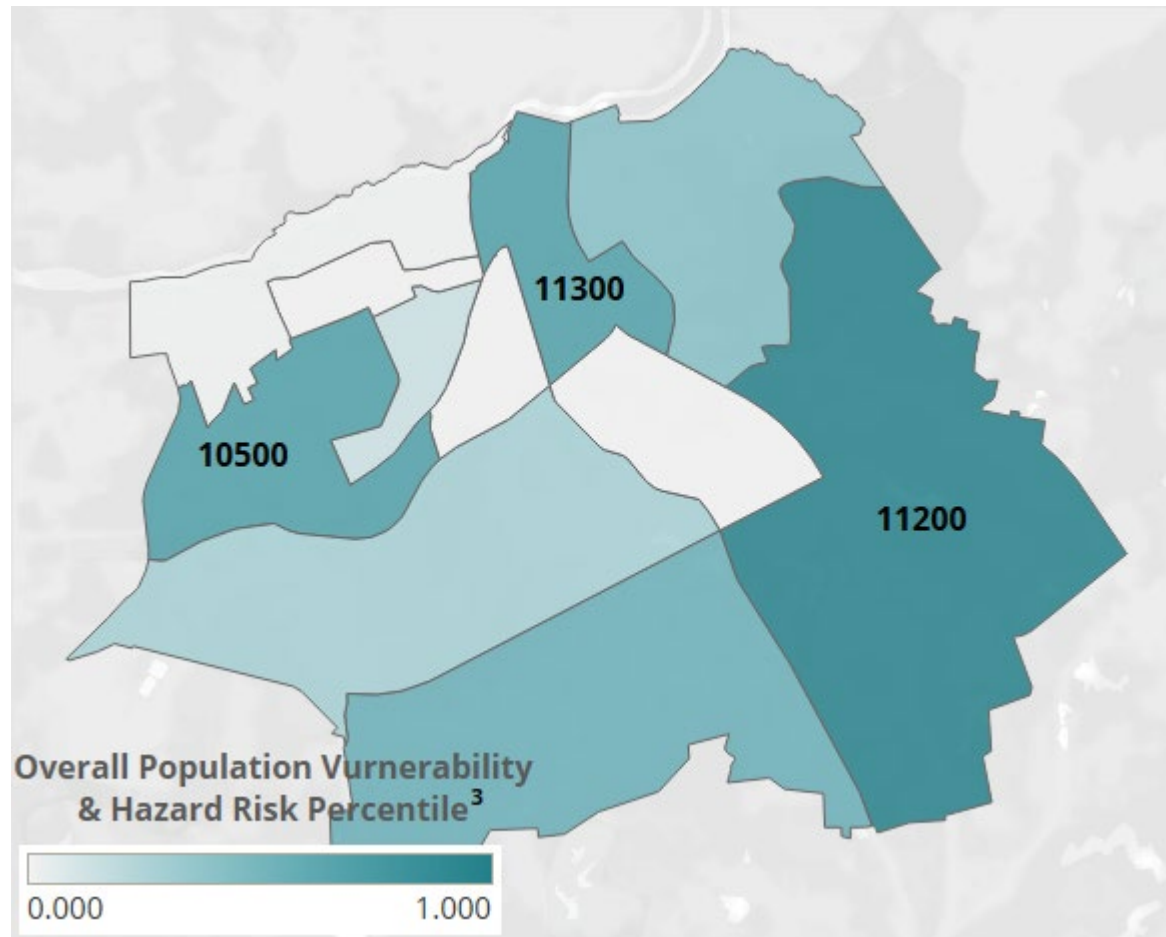
1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity

Prioritizing Census Tracts in Petersburg City continued

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.

Potential Priority Areas in Petersburg City



Priority Areas in Flood and Hurricane Zones

#	Area	# of Households	Within-Petersburg City Percentiles		
			Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	11200	66	100th	71st	86th
2	11300	109	71st	29th	100th
3	10500	32	71st	100th	29th
4	11100	59	57th	14th	71st
5	10100	47	43rd	43rd	43rd
6	11000	2	29th	86th	0th
7	10600	22	14th	57th	14th
8	10300	62	0th	0th	57th

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
3. Sub-localities at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Priority Census Tracts Summary

When evaluating future mitigation project opportunities, it may be helpful to consider the underlying attributes of population vulnerability and the number of houses in each flood/hurricane zone.

#	Census Tract	# of Households	Within-Petersburg City Percentiles									
			Overall	Population Vulnerability ¹	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unemployment Risk	Age	Lack of Vehicle Access
1	11200	66	100th	71st	71st	100th	57th	71st	86th	0th	71st	0th
2	11300	109	71st	29th	14th	71st	43rd	0th	14th	71st	57th	43rd
3	10500	32	71st	100th	86th	86th	100th	86th	100th	29th	86th	57th

#	Census Tract	# of Households	W/I-Petersburg City Percentiles		Petersburg City Household Counts ³							
			Overall	Hazard Risk ²	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D
1	11200	66	100th	86th	-	32	-	34	-	-	-	-
2	11300	109	71st	100th	-	93	10	6	-	-	-	-
3	10500	32	71st	29th	-	17	8	7	-	-	-	-

1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
3. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

Review of FEMA Funding & Past Mitigation Projects

Review of Mitigation Projects In Your Locality

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.

Total Exclusive Project Funding¹

\$75,000

This is the total amount of federal funding allotted to mitigation projects solely owned by your locality from 1990-2019

Total Shared Project Funding¹

\$442,500

This is the total amount of federal funding allotted to mitigation projects owned by your locality and at least 1 other from 1990-2019

Exclusive Projects

1

Average Project Size

\$75K

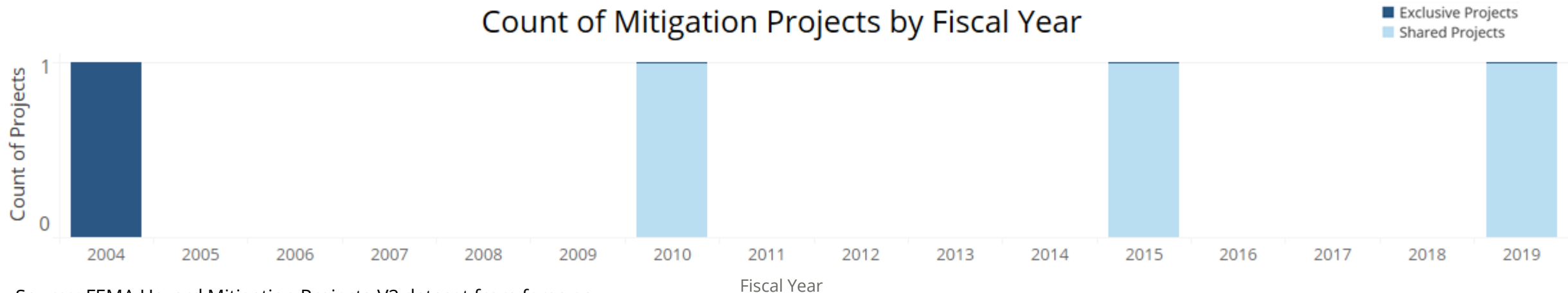
Shared Projects

3

Average Counties Per Project

17.0

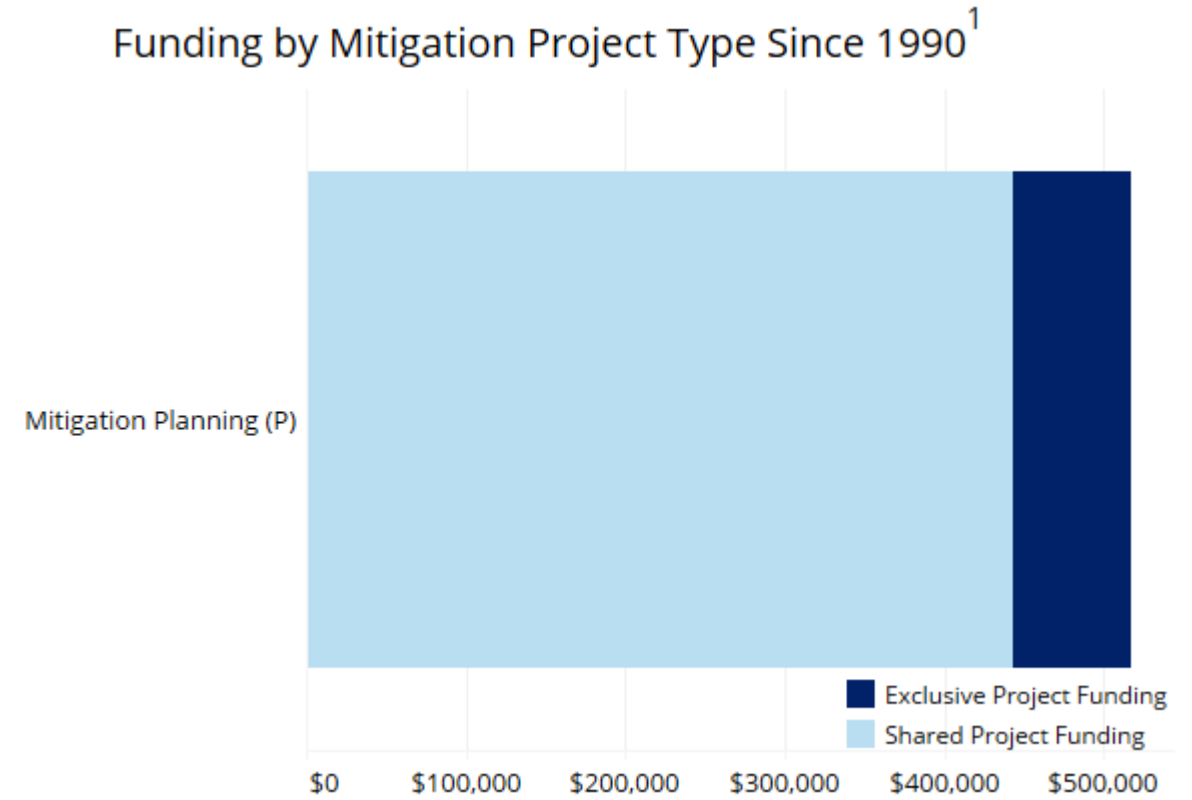
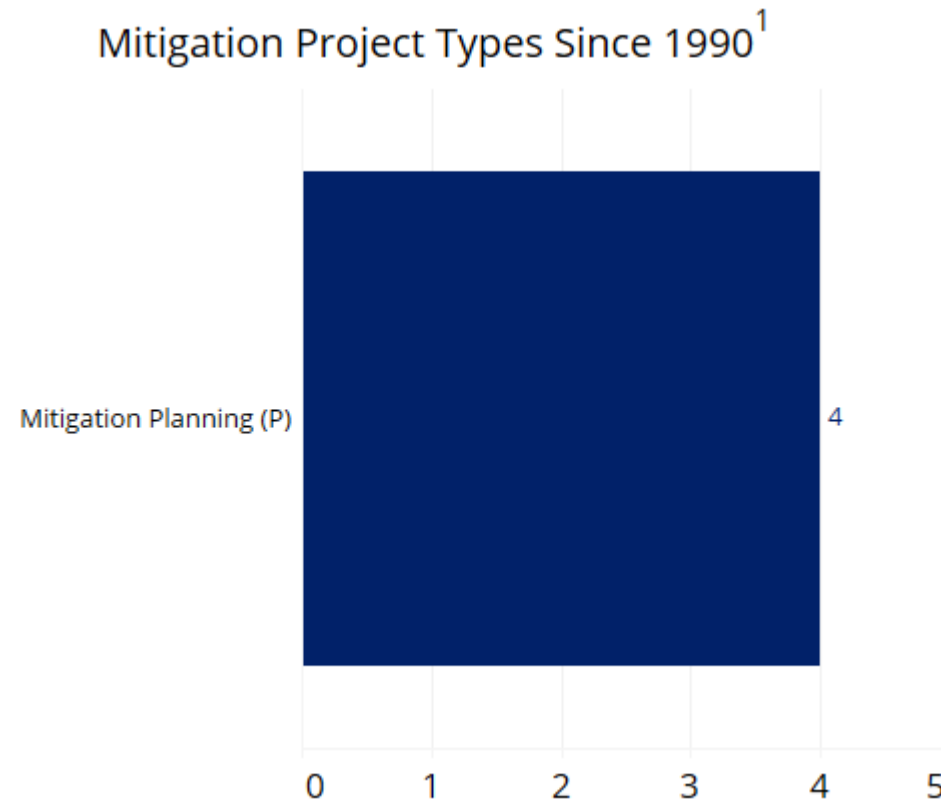
Count of Mitigation Projects by Fiscal Year



1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

Past Mitigation Projects – Top Project Types

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.



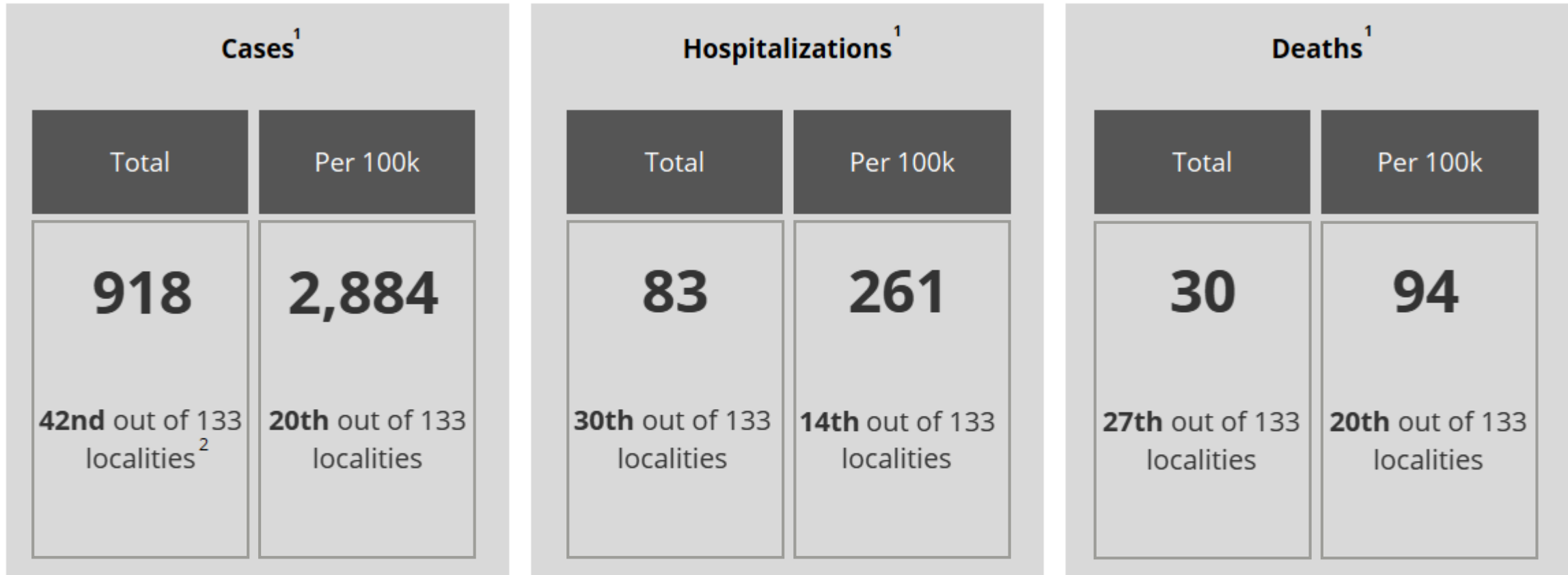
■ Exclusive Project Funding
■ Shared Project Funding

1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

COVID-19 Impacts

COVID-19 In Your Locality

Since the beginning of the COVID-19 Pandemic, Petersburg City has experienced the following:



1. COVID-19 case, hospitalization, and death figures are sourced from the Virginia Department of Health as of **10/26/2020**

2. COVID-19 Impact rankings are for all 133 Virginia localities, rather than the 132 included in the BRIC analysis for having at least one household in a flood or hurricane zone

Considerations for Next Steps

Considerations for Next Steps

When evaluating future mitigation project opportunities, the population vulnerability and hazard risk metrics can supplement existing measures to design mitigation projects with an equity lens.

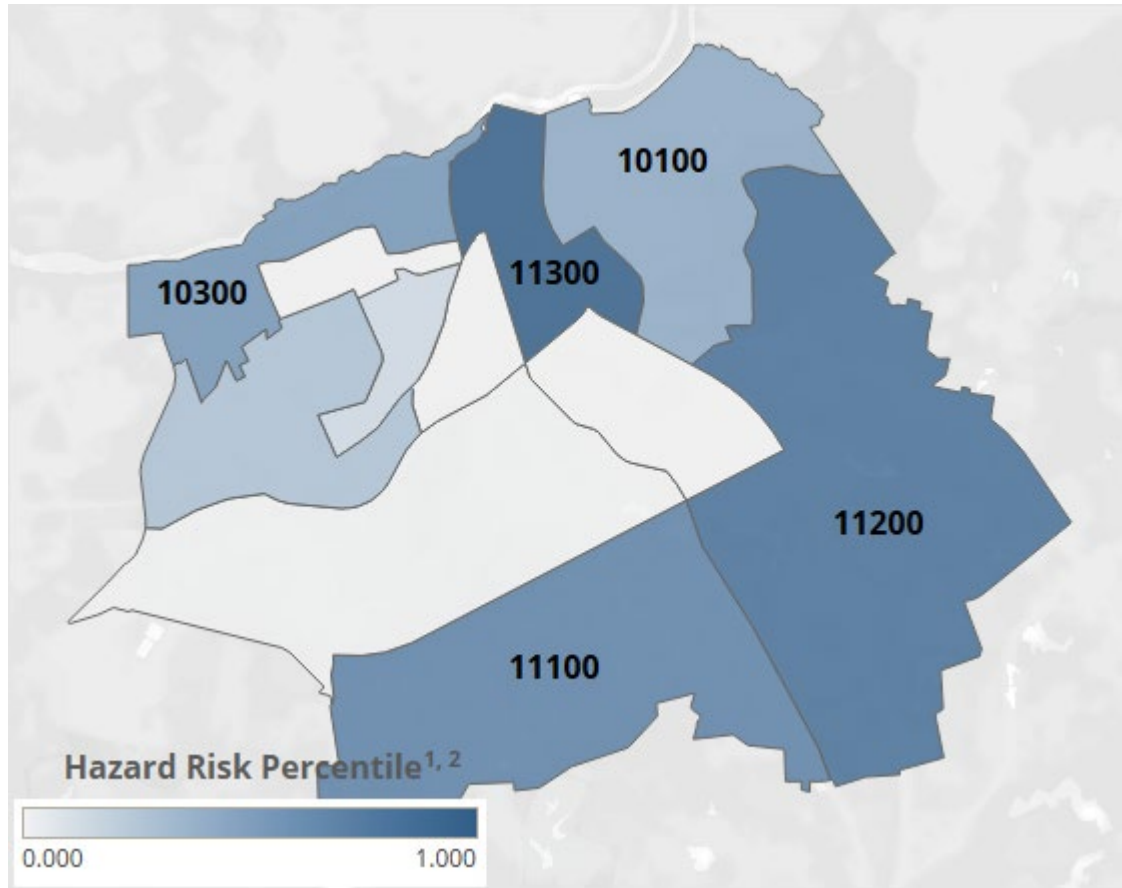
- Consider targeting **priority areas** when designing future mitigation projects
- Consider analysis at the **census tract/block level** to understand population vulnerability and hazard risks at a granular level to support decisions on mitigation projects
- Consider **supplementing these people-focused metrics** with existing infrastructure, elevation, and financial analysis for a holistic mitigation planning approach that includes equity considerations
- Consider **past project types** and **prior funding** in the overall mitigation strategy

Appendix

What areas in your locality have the greatest hazard risk?

When designing mitigation projects, it may be helpful to consider specific census tracts that have the greatest number of households residing in the more severe flood and/or hurricane zones.

Hazard Risk¹ in Petersburg City



Top-5 Census Tracts for Hazard Risk¹

#	Census Tract	# of Households	Hazard Risk Percentile	Petersburg City Household Counts							
				100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr. Zone D
1	11300	109	100th	0	93	10	6	0	0	0	0
2	11200	66	86th	0	32	0	34	0	0	0	0
3	11100	59	71st	0	26	32	1	0	0	0	0
4	10300	62	57th	0	4	50	8	0	0	0	0
5	10100	47	43rd	0	0	2	45	0	0	0	0

Note: see the appendix for a complete data table for all Census Tracts

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

What is population vulnerability and how is it calculated? *continued*

The vulnerability score for each Virginia household reflects an estimate of the household's ability to safely respond in the event of an environmental disaster.



Population Vulnerability

Attribute ¹	Weighting ²	Description (in a household)
Low Income	18%	Number of adults with income less than \$30,000
Elevated Health Risk	17%	Number of adults with one or more serious health conditions
Age (Older Adults)	15%	Number of adults who are age 65 and older
Communities of Color	13%	Number of Black or African American or Hispanic or Latino adults
# of Children in Household	12%	Number of children
# of People in Household	10%	Number of adults and children
Unemployment Risk	8%	Number of adults at high risk of unemployment
Lack of Vehicle Access	6%	Does the household lack access to a motor vehicle?

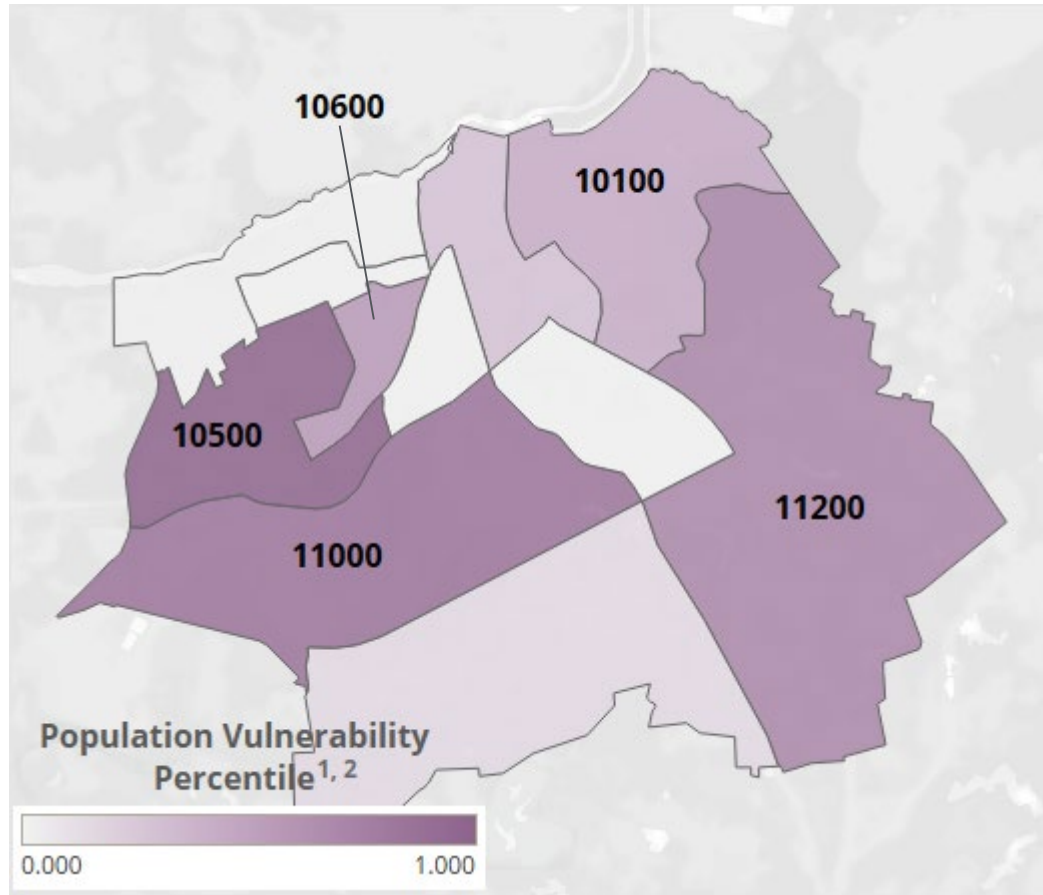
1. Two attributes - English as a Primary Language and Prevalence of Mobile Housing - were dropped from consideration based on the 8/20/2020 BRIC Working Group Session

2. Attribute contributions to Population Vulnerability were weighted as a result of the BRIC Working Group Session on 8/20/2020

What areas in your locality have the greatest population vulnerability?

When designing mitigation projects, it may be helpful to consider specific census tracts that are home to the most vulnerable individuals in the event of an environmental disaster.

Population Vulnerability¹ in Petersburg City



Top-5 Census Tracts for Population Vulnerability¹

#	Census Tract	# of Households	Within-Petersburg City Percentiles								
			Pop. Vul.	Comm. of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unem. Risk	Age	Vehicle Access
1	10500	32	100th	86th	86th	100th	86th	100th	29th	86th	57th
2	11000	2	86th	100th	0th	0th	100th	0th	100th	100th	100th
3	11200	66	71st	71st	100th	57th	71st	86th	0th	71st	0th
4	10600	22	57th	57th	43rd	71st	14th	29th	86th	29th	71st
5	10100	47	43rd	43rd	29th	86th	43rd	43rd	43rd	14th	86th

Note: See the appendix for a complete data table for all census tracts

1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Data table | Population Vulnerability & Hazard Risk

			Percentiles											Within-locality Household Counts									
#	Census Tract	# of Households	Overall	Population Vulnerability	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unem- ployment Risk	Age	Lack of Vehicle Access	Hazard Risk	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D		
1	11200	66	100th	71st	71st	100th	57th	71st	86th	0th	71st	0th	86th	0	32	0	34	0	0	0	0		
2	11300	109	71st	29th	14th	71st	43rd	0th	14th	71st	57th	43rd	100th	0	93	10	6	0	0	0	0		
3	10500	32	71st	100th	86th	86th	100th	86th	100th	29th	86th	57th	29th	0	17	8	7	0	0	0	0		
4	11100	59	57th	14th	29th	57th	29th	57th	71st	57th	0th	14th	71st	0	26	32	1	0	0	0	0		
5	10100	47	43rd	43rd	43rd	29th	86th	43rd	43rd	43rd	14th	86th	43rd	0	0	2	45	0	0	0	0		
6	11000	2	29th	86th	100th	0th	0th	100th	0th	100th	100th	100th	0th	0	0	2	0	0	0	0	0		
7	10600	22	14th	57th	57th	43rd	71st	14th	29th	86th	29th	71st	14th	0	12	8	2	0	0	0	0		
8	10300	62	0th	0th	0th	14th	14th	29th	57th	14th	43rd	29th	57th	0	4	50	8	0	0	0	0		

1. Note: These figures only account for census areas that have households in flood and/or hurricane zones

For internal use only by the Commonwealth of Virginia. Output based on available data.

Data table | FEMA Funding¹

Grantee	Year of Fiscal Year	Exclusive vs Shared	Subgrantee	Project Counties	Project Type(s)	Federal Funds Obligated
PETERSBURG CITY	2019	Shared	RICHMOND REGIONAL PLANNING DIST COMMISSION	PETERSBURG (CITY); EMPORIA (CITY); COLONIAL HEIGHTS (CITY); CHARLES CITY; CHESTERFIELD; DINWIDDIE; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; NEW K..	91.5: Local Multijurisdictional Multihazard Mitigation Plan - UPDATE	\$187,500
	2015	Shared	Richmond Regional Planning District Commission	CHARLES CITY; CHESTERFIELD; COLONIAL HEIGHTS CITY; DINWIDDIE; EMPORIA CITY; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; HOPEWELL CITY; NEW KENT; ..	91.1: Local Multihazard Mitigation Plan	\$135,000
	2010	Shared	Richmond and Crater PDC	CHARLES CITY; CHESTERFIELD; COLONIAL HEIGHTS CITY; DINWIDDIE; EMPORIA CITY; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; HOPEWELL CITY; NEW KENT; ..	91.1: Local Multihazard Mitigation Plan	\$120,000
	2004	Exclusive	VIRGINIA STATE UNIVERSITY	PETERSBURG	90.4: Mitigation Plan - Local Multihazard Mitigation Plan	\$75,000

1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

COVID-19 Unified Command/VEST Health Equity Working Group

MITIGATION PROJECTS ANALYSIS
DINWIDDIE COUNTY

NOVEMBER 2020



Topics

The analysis provides **Dinwiddie County** with information to support planning and preparation of projects for the Building Resilient Infrastructure and Communities (BRIC) grant application with an equity focus.

- ❑ Introduction to Data-Driven Approach
- ❑ Hazard Risk
- ❑ Population Vulnerability
- ❑ Prioritization
- ❑ FEMA Funding and Past Projects
- ❑ Considerations for Next Steps

This analysis ***expands the scope of population vulnerability*** to provide a ***data-driven equity lens*** for disaster mitigation project design

Data-Driven Approach

The Health360 platform informs population vulnerability and enables a data-driven approach to operationalizing equity in mitigation projects.

Powered By Health360



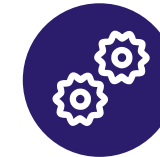
230M+
U.S. Adults Scored



Data updated every
1 Month



Contains over
1,500+
variables on Social
Determinants of Health
and other metrics



150+
Advanced predictive
algorithms



400+

Variables used in the
mortality predictive
algorithm



Provides **360°** view
of a person



Algorithms rebuilt
every **2 years**



40+
Clients served

What is hazard risk and how is it calculated?

Household Hazard risk reflects the number of households in each flood or hurricane zone, weighted by severity.



Hazard Risk

Number of households in each zone:

Flood zones

- 100 year coastal
- 100 year riverine flood way
- 100 year riverine
- 500 year riverine

Hurricane zones

- Segmented A, B, C, D

- Households that reside in the flood and hurricane zones are considered to be **at-risk for environmental disasters**
- Hazard Risk reflects **the number of households located in Flood and Hurricane Zones**
- Hazard Risk is not a measure of **infrastructure, elevation, or financial risks**, but is a measure of the number of at-risk households in an area, weighted by the severity of the risk, to **provide a people-focused risk metric**

Note: Severity of the risk per household is captured on an ordinal scale from 1 – least severe (Hurricane Zone D, 500 Year Riverine) to 4 – most severe (Hurricane Zone A, 100 Year Coastal)

Hazard Risk = (# of Households in Particular Hurricane or Flood Zones) X (Specified Zone Risk Level (1 through 4 depending on risk severity))

Hazard Risk in Your Locality

The figures below indicate how your locality's hazard risk¹ compares to others in Virginia as well as how many households reside in each flood or hurricane zone.

Hazard Risk¹ Percentile
25th
Your locality has more households in more severe flood/hurricane zones than 25% of other Virginia localities

Hazard Risk¹ Rank
98th
Your locality's Hazard Risk score is ranked 98th out of 132 Virginia localities

Households in Flood Zones & Locality Rank

← 100 Year Coastal	100 Year Riverine Floodway	100 Year Riverine	→ Severity 500 Year Riverine
0	0	108	4
N/A out of 132 Localities	N/A out of 132 Localities	83rd out of 132 Localities	88th out of 132 Localities

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk

Households in Hurricane Zones & Locality Rank

← Zone A	Zone B	Zone C	→ Severity Zone D
0	0	0	0
N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities	N/A out of 132 Localities

Evacuation zones designated as A through D are in place across coastal Virginia

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

What is population vulnerability and how is it calculated?

The Population Vulnerability score provides a people-focused metric that can be combined with infrastructure, elevation, and financial metrics to support a holistic approach to mitigation planning.



Population Vulnerability

Prevalence of:

1. Communities of color
2. Elevated health risk
3. Low income
4. # of people in household
5. # of children in household
6. Unemployment risk
7. Age (older adults)
8. Lack of vehicle access

- Population Vulnerability **expands upon the 2018 Virginia Hazard Mitigation plan definition** of population vulnerability (density and percentage of total population)
- Population Vulnerability **only considers localities with households in flood or hurricane zones (132 localities)**
- Population Vulnerability **identifies the locality and census tracts/census blocks** with the most vulnerable individuals/households on average
- Population Vulnerability should be interpreted as a **household's ability to safely respond** to an environmental disaster

Population Vulnerability in Your Locality

The figures below indicate how your locality's population vulnerability¹ score and composite attributes compare to other localities in Virginia.

Population Vulnerability¹ Percentile

95th

On average, a household in a flood or hurricane zone in your locality is more vulnerable than a household in 95% of other Virginia localities

Population Vulnerability¹ Rank

7th

Your locality's Population Vulnerability score is ranked 7th out of 132 Virginia localities

How DINWIDDIE COUNTY Compares to Other Localities Across the Eight Vulnerability Attributes

Low Income

58th

percentile

Elevated Health Risk

89th

percentile

Age

80th

percentile

Communities of Color

89th

percentile

of Children in Household

82nd

percentile

of People in Household

91st

percentile

Unemployment Risk

58th

percentile

Lack of Vehicle Access

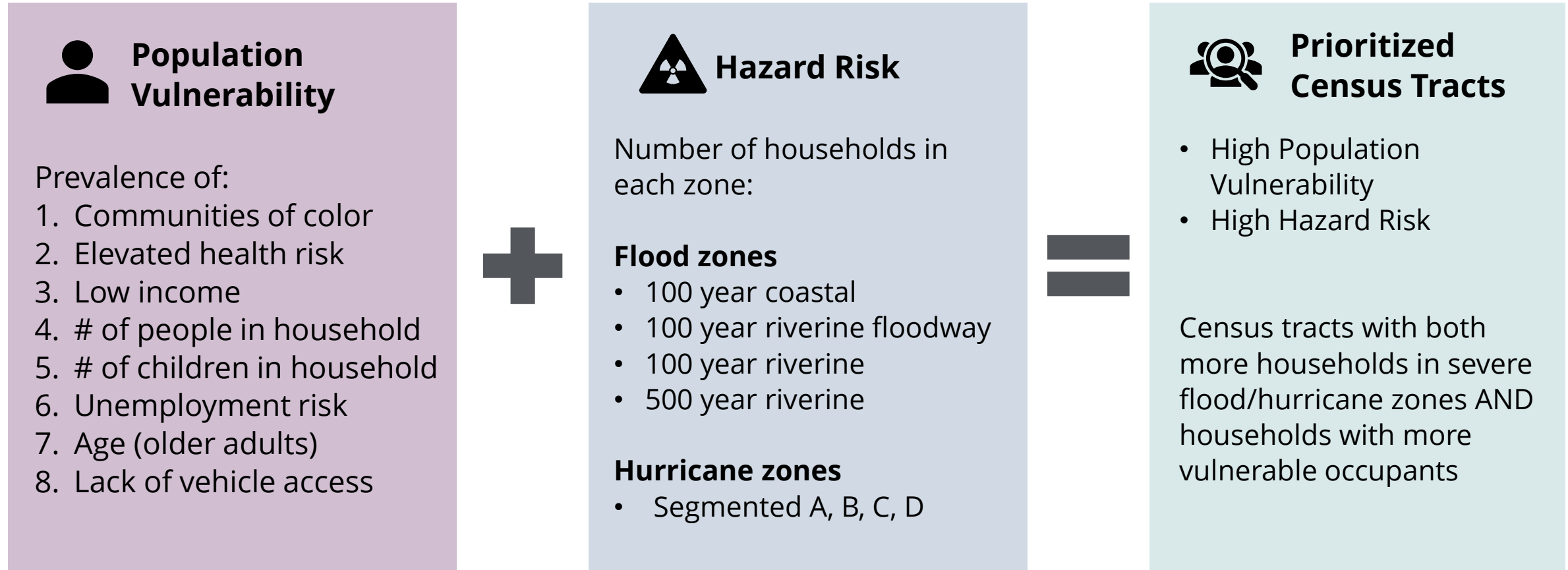
21st

percentile

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

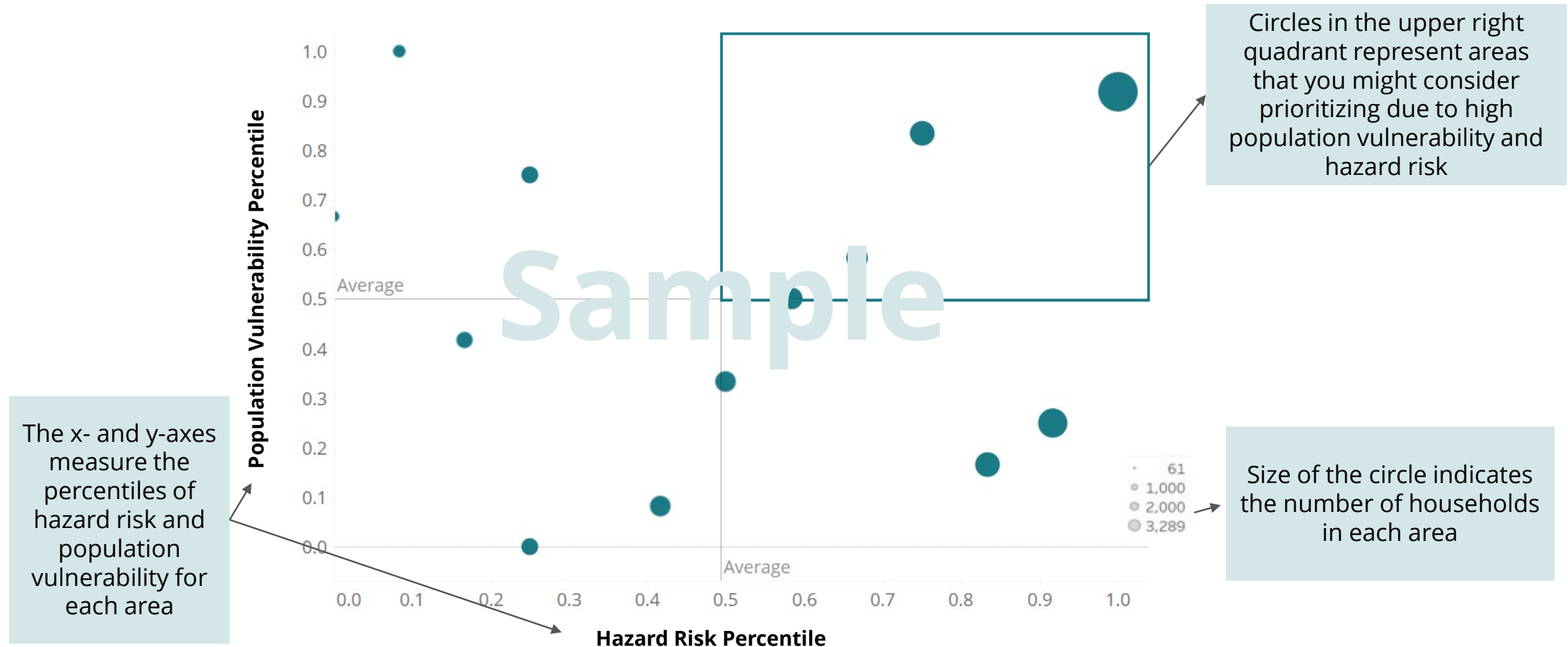
Using Population Vulnerability & Hazard Risk to Prioritize Census Tracts

Combining population vulnerability and hazard risk at a sub-locality level can identify potential priority areas to support with future mitigation projects.



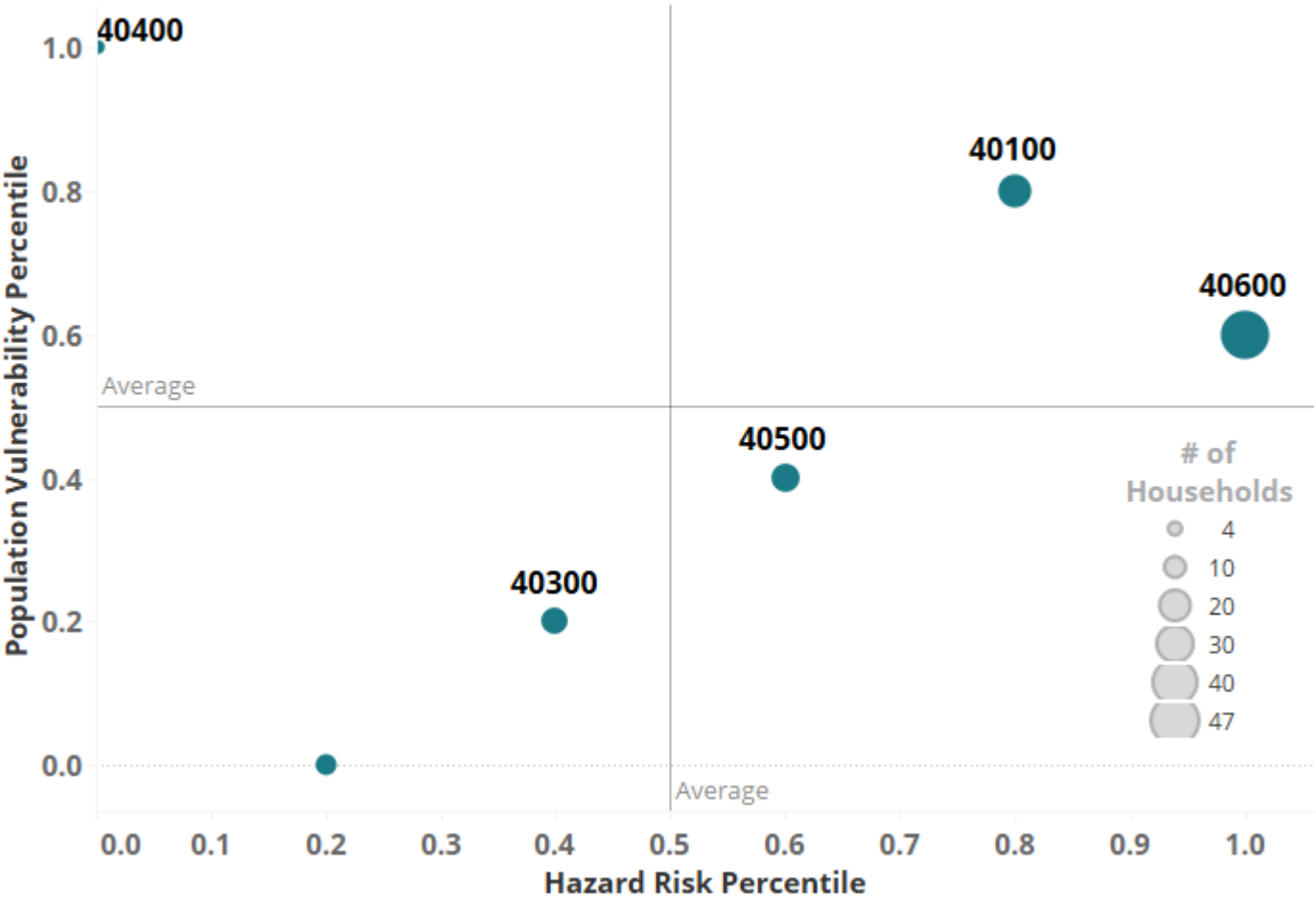
How to interpret the Census Tract plots

The chart below represents a *sample* locality and offers guidance on how to interpret the information when planning mitigation efforts.



Prioritizing Census Tracts in Dinwiddie County

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.



Priority Areas in Flood and Hurricane Zones

#	Area	# of Households	Within-Dinwiddie County Percentiles		
			Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	40600	47	80th	60th	100th
2	40100	22	80th	80th	80th
3	40500	16	40th	40th	60th
4	40400	4	40th	100th	0th
5	40300	14	20th	20th	40th
6	40200	9	0th	0th	20th

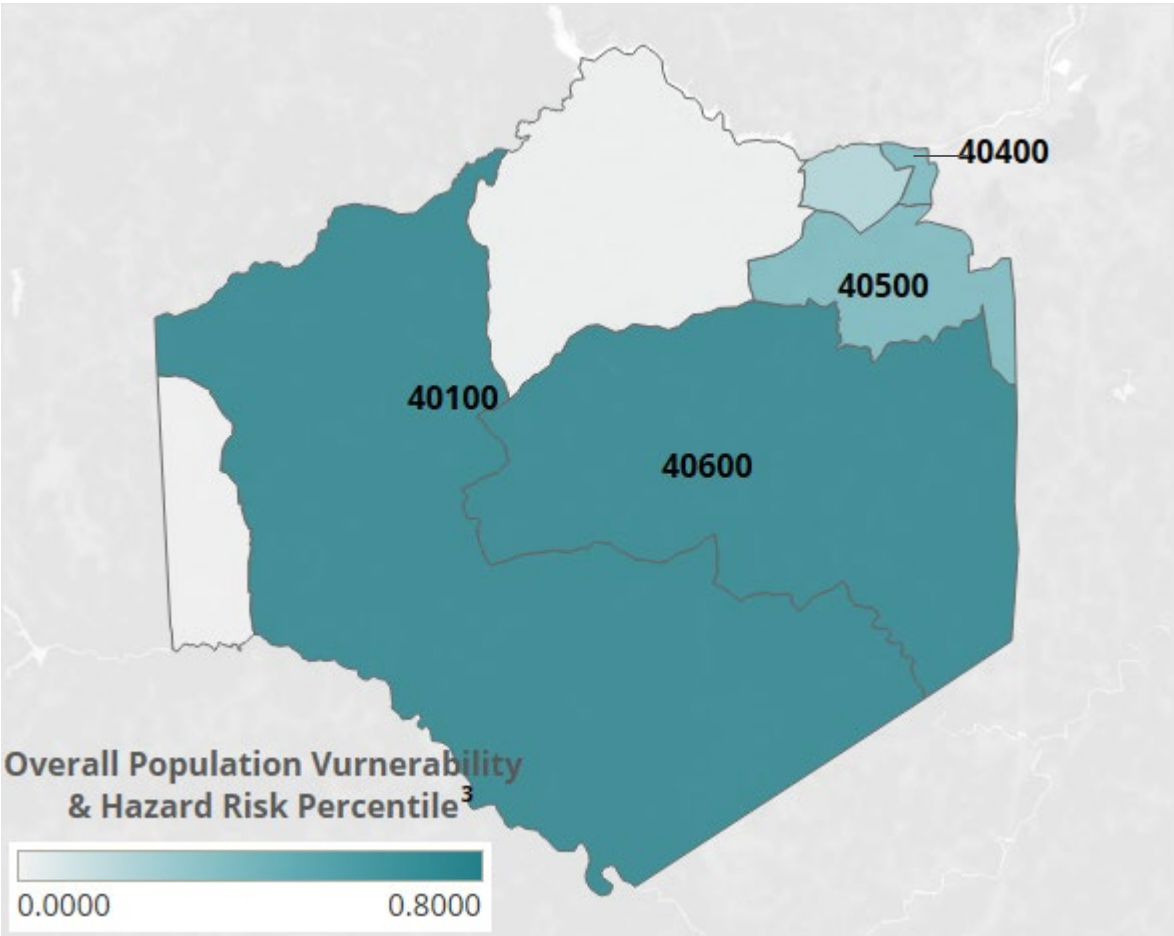
1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity

Prioritizing Census Tracts in Dinwiddie County continued

Areas with the most vulnerable populations and households in severe flood and hurricane zones present prioritization opportunities for mitigation projects.

Potential Priority Areas in Dinwiddie County



Priority Areas in Flood and Hurricane Zones

			Within-Dinwiddie County Percentiles		
#	Area	# of Households	Overall Percentile	Population Vulnerability ¹ Percentile	Hazard Risk ² Percentile
1	40600	47	80th	60th	100th
2	40100	22	80th	80th	80th
3	40500	16	40th	40th	60th
4	40400	4	40th	100th	0th
5	40300	14	20th	20th	40th
6	40200	9	0th	0th	20th

1. Population Vulnerability should be interpreted as a household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones

2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity

3. Sub-localities at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Priority Census Tracts Summary

When evaluating future mitigation project opportunities, it may be helpful to consider the underlying attributes of population vulnerability and the number of houses in each flood/hurricane zone.

#	Census Tract	# of Households	Within-Dinwiddie County Percentiles									
			Overall	Population Vulnerability ¹	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unemployment Risk	Age	Lack of Vehicle Access
1	40600	47	80th	60th	60th	80th	60th	40th	20th	40th	80th	80th
2	40100	22	80th	80th	100th	100th	20th	60th	40th	0th	100th	0th
3	40500	16	40th	40th	40th	60th	80th	80th	100th	60th	40th	0th

#	Census Tract	# of Households	W/I-Dinwiddie County Percentiles		Dinwiddie County Household Counts ³							
			Overall	Hazard Risk ²	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D
1	40600	47	80th	100th	-	-	47	-	-	-	-	-
2	40100	22	80th	80th	-	-	22	-	-	-	-	-
3	40500	16	40th	60th	-	-	16	-	-	-	-	-

1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
2. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
3. Note that the total sum of households may be more than the households in your locality because some are located in both flood and hurricane zones

Review of FEMA Funding & Past Mitigation Projects

Review of Mitigation Projects In Your Locality

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.

Total Exclusive Project Funding¹

\$0

This is the total amount of federal funding allotted to mitigation projects solely owned by your locality from 1990-2019

Total Shared Project Funding¹

\$442,500

This is the total amount of federal funding allotted to mitigation projects owned by your locality and at least 1 other from 1990-2019

Exclusive Projects

0

Average Project Size

\$0

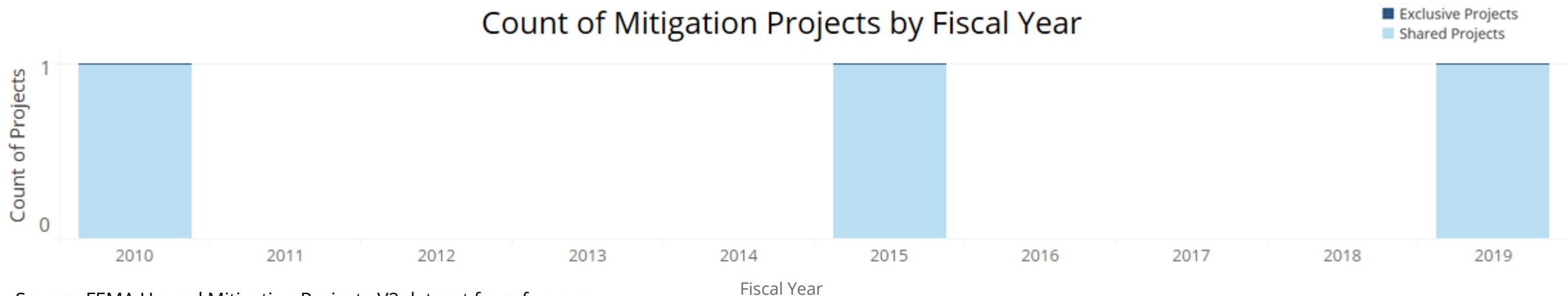
Shared Projects

3

Average Counties Per Project

17.0

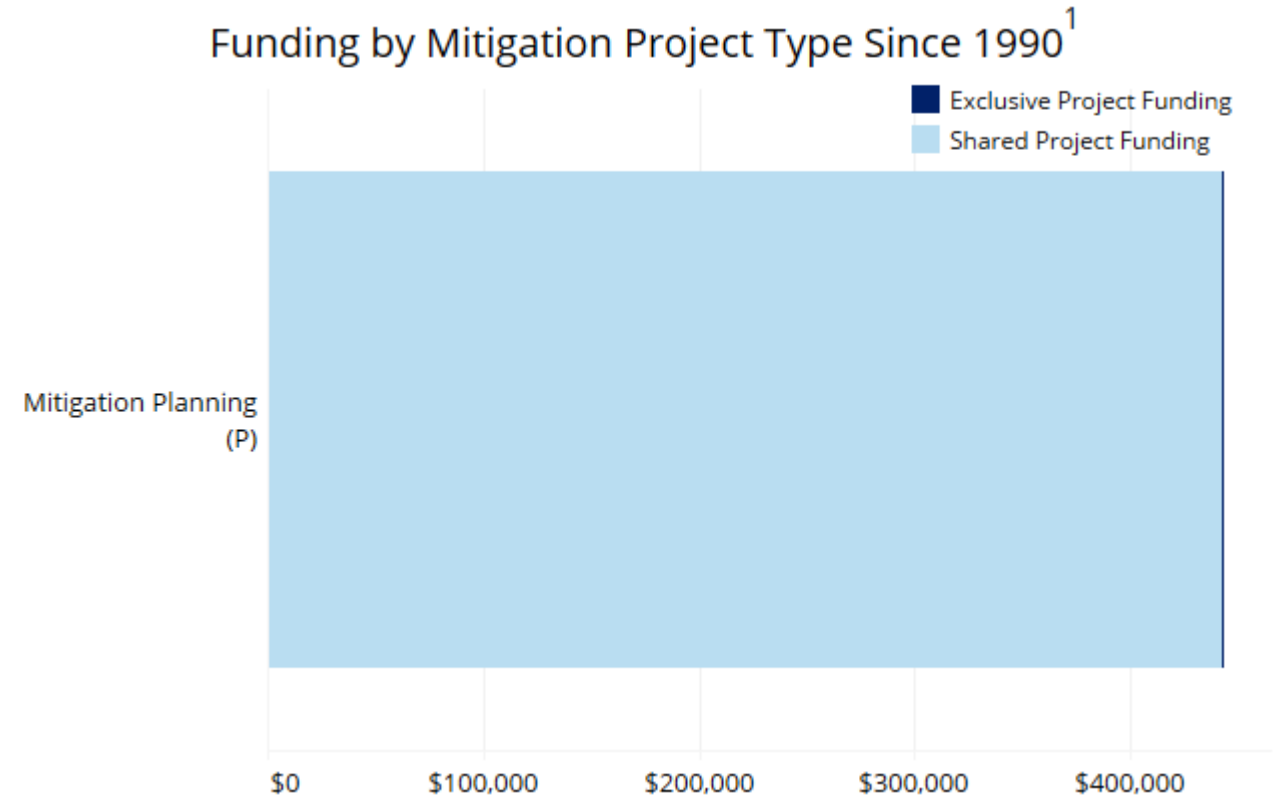
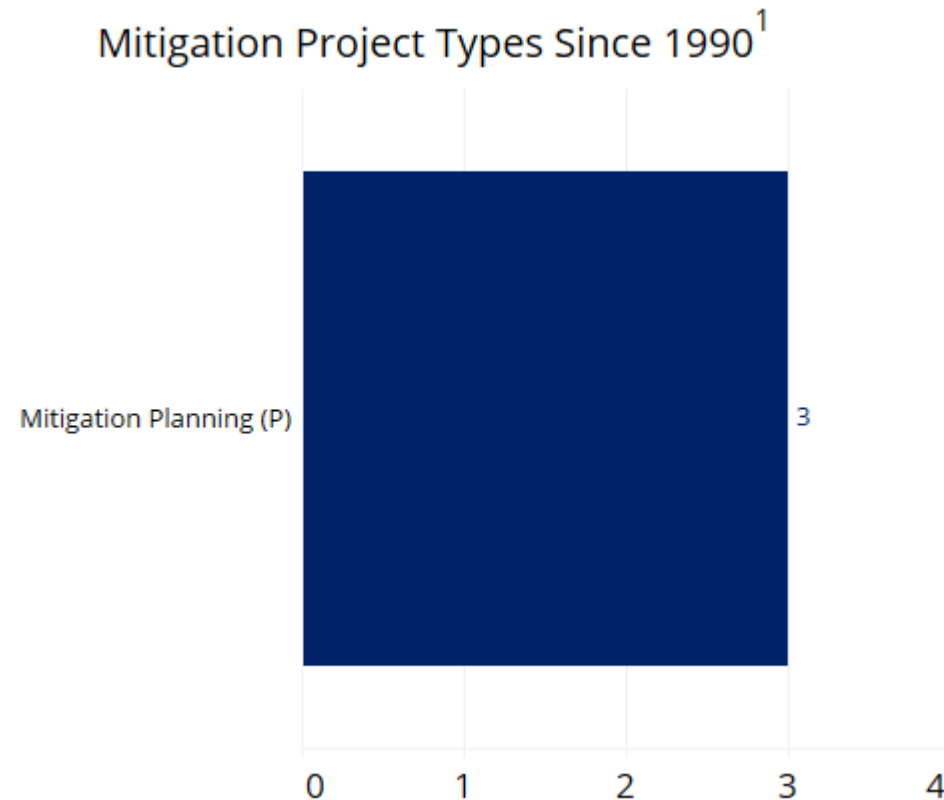
Count of Mitigation Projects by Fiscal Year



1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

Past Mitigation Projects – Top Project Types

The figures below provide information regarding mitigation projects¹ in your locality from 1990-2019 that may be helpful to consider in planning potential future mitigation projects.

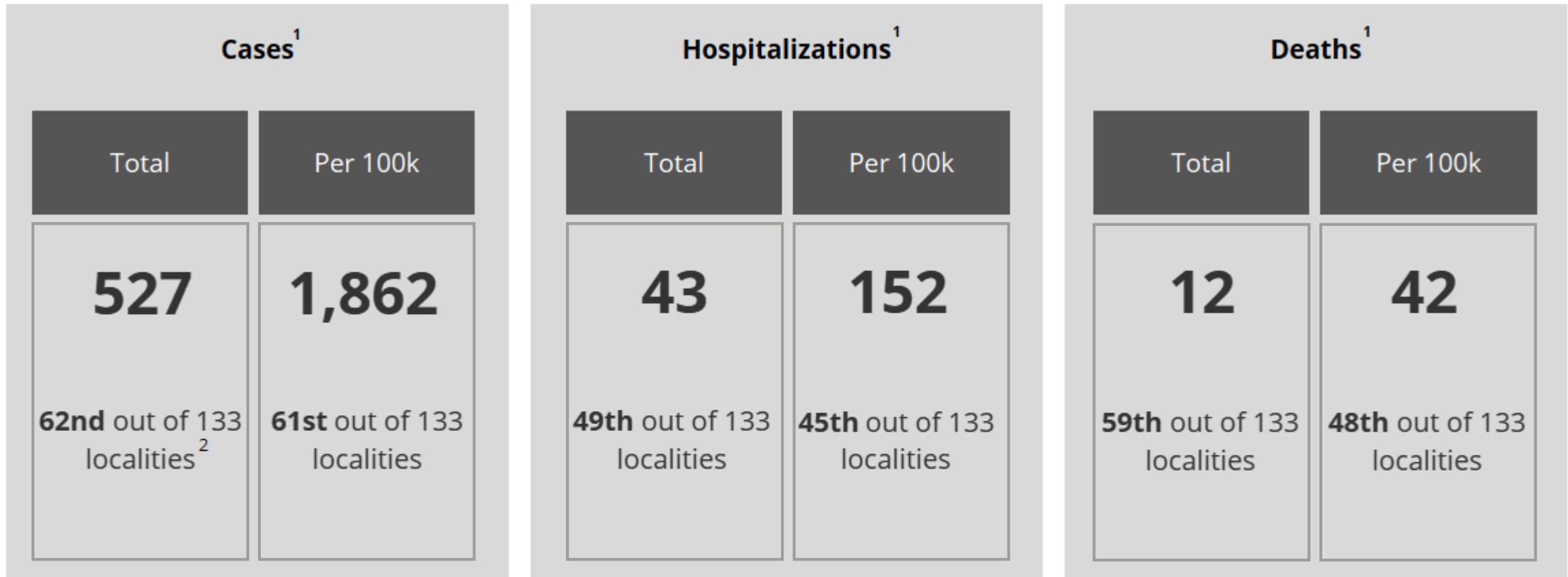


1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

COVID-19 Impacts

COVID-19 In Your Locality

Since the beginning of the COVID-19 Pandemic, Dinwiddie County has experienced the following:



1. COVID-19 case, hospitalization, and death figures are sourced from the Virginia Department of Health as of **10/28/2020**

2. COVID-19 Impact rankings are for all 133 Virginia localities, rather than the 132 included in the BRIC analysis for having at least one household in a flood or hurricane zone

Considerations for Next Steps

Considerations for Next Steps

When evaluating future mitigation project opportunities, the population vulnerability and hazard risk metrics can supplement existing measures to design mitigation projects with an equity lens.

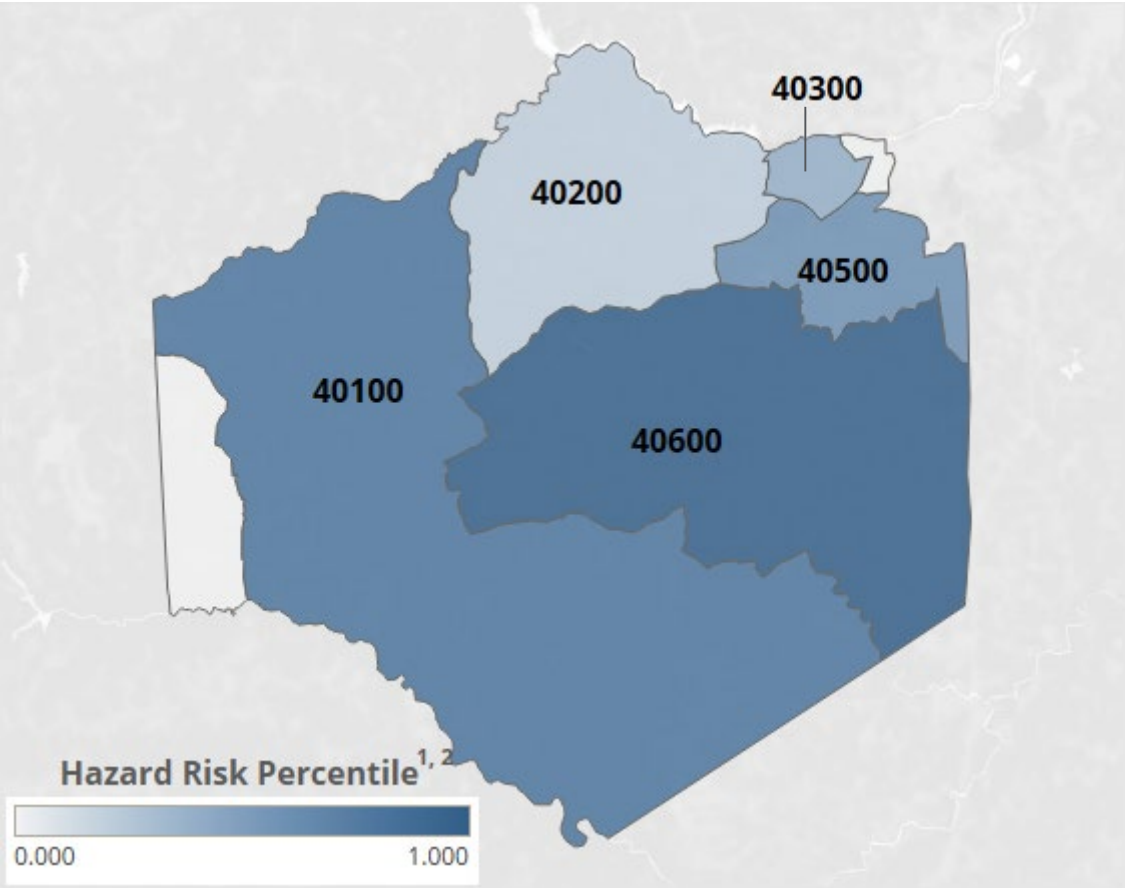
- Consider targeting **priority areas** when designing future mitigation projects
- Consider analysis at the **census tract/block level** to understand population vulnerability and hazard risks at a granular level to support decisions on mitigation projects
- Consider **supplementing these people-focused metrics** with existing infrastructure, elevation, and financial analysis for a holistic mitigation planning approach that includes equity considerations
- Consider **past project types** and **prior funding** in the overall mitigation strategy

Appendix

What areas in your locality have the greatest hazard risk?

When designing mitigation projects, it may be helpful to consider specific census tracts that have the greatest number of households residing in the more severe flood and/or hurricane zones.

Hazard Risk¹ in Dinwiddie County



Top-5 Census Tracts for Hazard Risk¹

				Dinwiddie County Household Counts							
#	Census Tract	# of House-holds	Hazard Risk Percentile	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr. Zone D
1	40600	47	100th	0	0	47	0	0	0	0	0
2	40100	22	80th	0	0	22	0	0	0	0	0
3	40500	16	60th	0	0	16	0	0	0	0	0
4	40300	14	40th	0	0	14	0	0	0	0	0
5	40200	9	20th	0	0	9	0	0	0	0	0

Note: see the appendix for a complete data table for all Census Tracts

1. Hazard risk reflects the number of households located in Flood and Hurricane Zones, weighted by severity
2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

What is population vulnerability and how is it calculated? *continued*

The vulnerability score for each Virginia household reflects an estimate of the household's ability to safely respond in the event of an environmental disaster.



Population Vulnerability

Attribute ¹	Weighting ²	Description (in a household)
Low Income	18%	Number of adults with income less than \$30,000
Elevated Health Risk	17%	Number of adults with one or more serious health conditions
Age (Older Adults)	15%	Number of adults who are age 65 and older
Communities of Color	13%	Number of Black or African American or Hispanic or Latino adults
# of Children in Household	12%	Number of children
# of People in Household	10%	Number of adults and children
Unemployment Risk	8%	Number of adults at high risk of unemployment
Lack of Vehicle Access	6%	Does the household lack access to a motor vehicle?

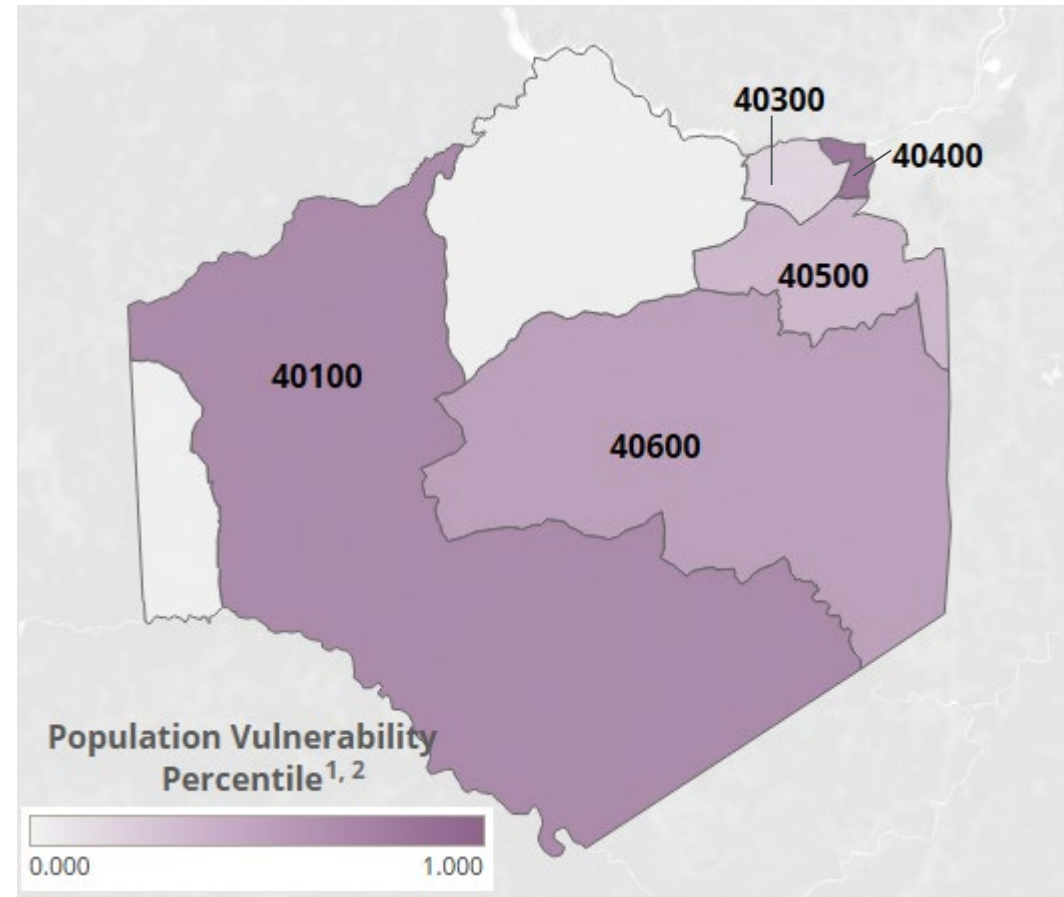
1. Two attributes - English as a Primary Language and Prevalence of Mobile Housing - were dropped from consideration based on the 8/20/2020 BRIC Working Group Session

2. Attribute contributions to Population Vulnerability were weighted as a result of the BRIC Working Group Session on 8/20/2020

What areas in your locality have the greatest population vulnerability?

When designing mitigation projects, it may be helpful to consider specific census tracts that are home to the most vulnerable individuals in the event of an environmental disaster.

Population Vulnerability¹ in Dinwiddie County



Top-5 Census Tracts for Population Vulnerability¹

Within-Dinwiddie County Percentiles											
#	Census Tract	# of House-holds	Pop. Vul.	Comm. of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unem. Risk	Age	Vehicle Access
1	40400	4	100th	0th	40th	100th	100th	60th	60th	60th	0th
2	40100	22	80th	100th	100th	20th	60th	40th	0th	100th	0th
3	40600	47	60th	60th	80th	60th	40th	20th	40th	80th	80th
4	40500	16	40th	40th	60th	80th	80th	100th	60th	40th	0th
5	40300	14	20th	80th	20th	40th	20th	80th	100th	20th	100th

Note: See the appendix for a complete data table for all census tracts

- 1. Population Vulnerability should be interpreted as an average household's ability to safely respond to an environmental disaster and only considers households located in flood or hurricane zones
- 2. Census tracts at the 0th percentile (areas in white) do not have households in Flood or Hurricane Zones

Data table | Population Vulnerability & Hazard Risk

			Percentiles										Within-locality Household Counts								
#	Census Tract	# of Households	Overall	Population Vulnerability	Communities of Color	Elevated Health Risk	Low Income	# of People	# of Children	Unemployment Risk	Age	Lack of Vehicle Access	Hazard Risk	100 Year Coastal	100 Year Riverine FW	100 Year Riverine	500 Year Riverine	Hurr. Zone A	Hurr. Zone B	Hurr. Zone C	Hurr Zone D
1	40600	47	80th	60th	60th	80th	60th	40th	20th	40th	80th	80th	100th	0	0	47	0	0	0	0	0
2	40100	22	80th	80th	100th	100th	20th	60th	40th	0th	100th	0th	80th	0	0	22	0	0	0	0	0
3	40500	16	40th	40th	40th	60th	80th	80th	100th	60th	40th	0th	60th	0	0	16	0	0	0	0	0
4	40400	4	40th	100th	0th	40th	100th	100th	60th	60th	60th	0th	0th	0	0	0	4	0	0	0	0
5	40300	14	20th	20th	80th	20th	40th	20th	80th	100th	20th	100th	40th	0	0	14	0	0	0	0	0
6	40200	9	0th	0th	20th	0th	0th	0th	0th	20th	0th	0th	20th	0	0	9	0	0	0	0	0

1. Note: These figures only account for census areas that have households in flood and/or hurricane zones

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Data table | FEMA Funding¹

Grantee	Year of Fiscal Year	Exclusive vs Shared	Subgrantee	Project Counties	Project Type(s)	Federal Funds Obligated
DINWIDDIE COUNTY	2019	Shared	RICHMOND REGIONAL PLANNING DIST COMMISSION	PETERSBURG (CITY); EMPORIA (CITY); COLONIAL HEIGHTS (CITY); CHARLES CITY; CHESTERFIELD; DINWIDDIE; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; NEW KENT; POWHATAN; PRINCE GEORGE; HOPEWELL (CITY); S..	91.5: Local Multijurisdictional Multihazard Mitigation Plan - UPDATE	\$187,500
	2015	Shared	Richmond Regional Planning District Commission	CHARLES CITY; CHESTERFIELD; COLONIAL HEIGHTS CITY; DINWIDDIE; EMPORIA CITY; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; HOPEWELL CITY; NEW KENT; PETERSBURG CITY; POWHATAN; PRINCE GEORG..	91.1: Local Multihazard Mitigation Plan	\$135,000
	2010	Shared	Richmond and Crater PDC	CHARLES CITY; CHESTERFIELD; COLONIAL HEIGHTS CITY; DINWIDDIE; EMPORIA CITY; GOOCHLAND; GREENSVILLE; HANOVER; HENRICO; HOPEWELL CITY; NEW KENT; PETERSBURG CITY; POWHATAN; PRINCE GEORG..	91.1: Local Multihazard Mitigation Plan	\$120,000

1. Source: FEMA Hazard Mitigation Projects-V2 dataset from [fema.gov](https://www.fema.gov)

